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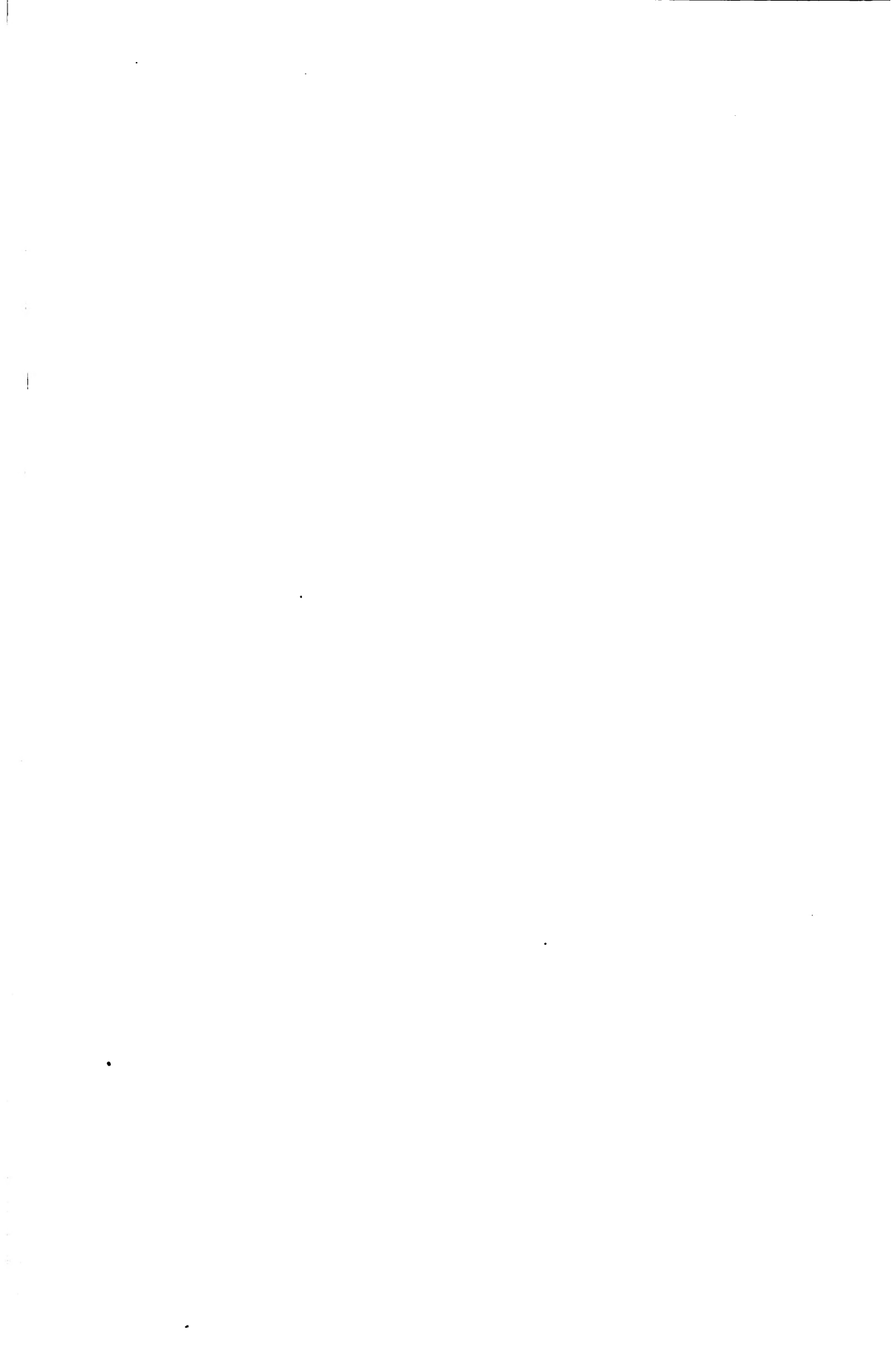
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THE
AMERICAN EPHEMERIS

AND
NAUTICAL ALMANAC.

FOR THE YEAR

1863.

PUBLISHED BY AUTHORITY OF THE SECRETARY OF THE NAVY.



BUREAU OF ORDNANCE AND HYDROGRAPHY,
WASHINGTON.

1861.

CAMBRIDGE:
ELECTROTYPED AND PRINTED BY WELCH, BIGELOW, & CO.



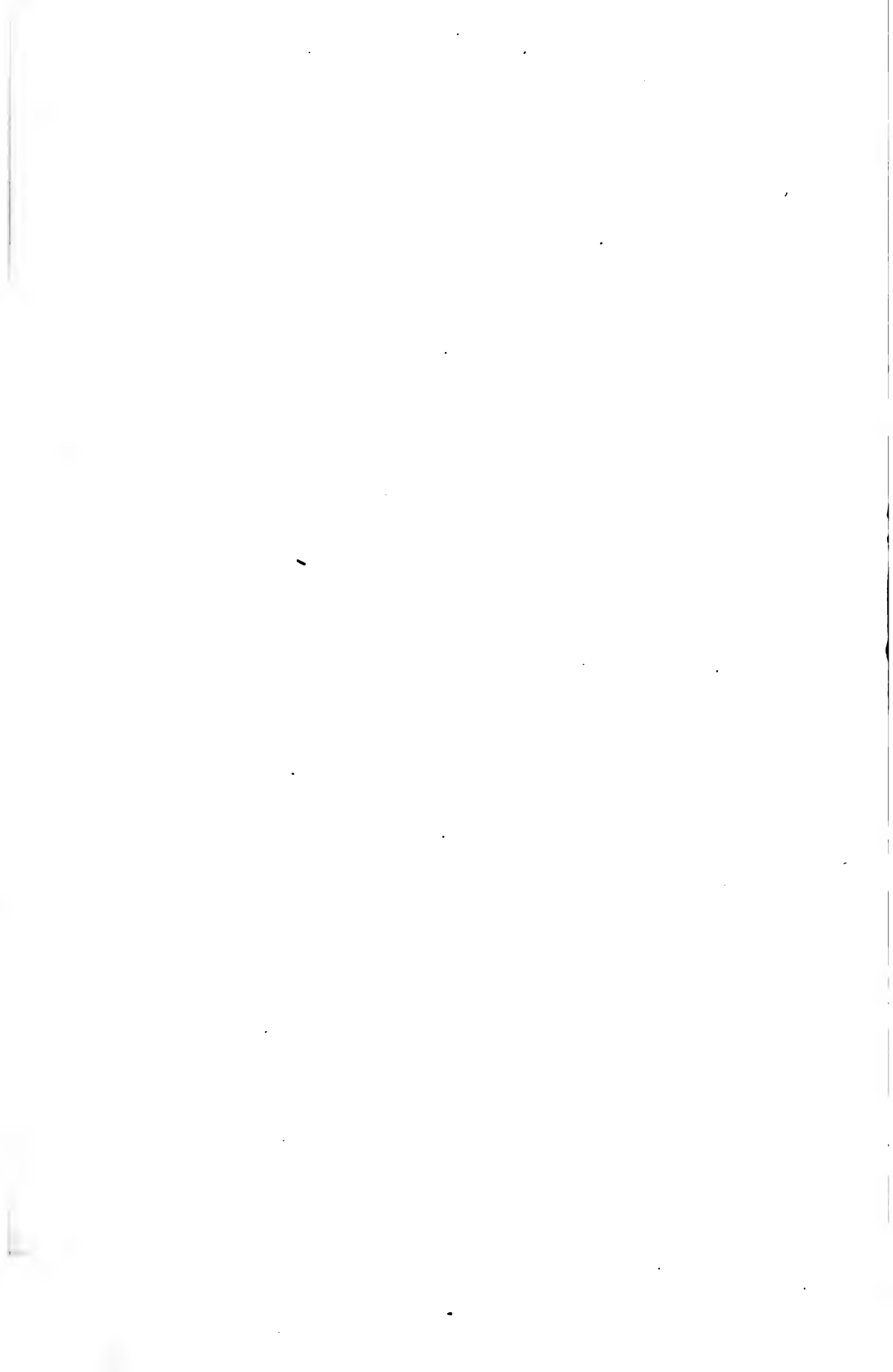
P R E F A C E .

THE preparation of the American Ephemeris and Nautical Almanac was begun in the latter part of the year 1849, in accordance with an act of Congress, approved on the 3d of March of that year. An account of this preparation, its details, the values of the constants adopted, and the means employed in various parts of the work to secure additional accuracy, or greater convenience, will be found in the Preface and Appendix of the first volume, for the year 1855.

The contents of the volume for this year are the same, generally, as those of the volume for the previous year.

CHARLES HENRY DAVIS,
Commander U. S. Navy, Superintendent.

CAMBRIDGE, October, 1861.



CONTENTS.

Chronological Eras and Cycles	Page vii
Symbols and Abbreviations	viii

EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Ephemeris of the Sun	Page of the Month. I.
Ephemeris of the Moon	IV.
Lunar Distances	XIII.
Ephemerides of the Planets, Venus — Saturn	Page 218
Sun's Coördinates	242
Moon's Longitude	245

EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Obliquity of the Ecliptic, &c.	250
Fixed Stars	251
Ephemeris of the Sun	299
Moon Culminations	305
Moon-Culminating Stars	320
Moon's Semidiameter, Horizontal Parallax, and Meridian Transit	328
Moon's Phases	334
Moon's Equator	335
Ephemerides of the Planets, Mercury — Neptune	336
Horizontal Parallaxes and Semidiameters of the Planets	378
Sun's Coördinates	380
Heliocentric Coördinates of the Planets	392
Eclipses	400
Occultations	407
Jupiter's Satellites	438
Saturn's Ring, Discs of Venus and Mars	471
Phenomena, Planetary Constellations	472
Latitudes and Longitudes of Observatories	474
Use of the Tables	485

APPENDIX.

Construction of the Ephemerides	1
Table for changing Longitude and Latitude to Right Ascension and Declination, and the Reverse	6
Moon's Libration	8
Moon's Mean Motion	9
Table of Logarithms of Small Arcs	10
Table of Corrections for Second Differences in Moon's Motion	28
Table for converting Sidereal into Mean Solar Time, and the Reverse	29
Table giving Corrections of α Ursæ Minoris and δ Ursæ Minoris	35



CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1863, WHICH COMPRISES THE LATTER PART OF THE 87TH AND THE BEGINNING OF THE 88TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO

The year 6576 of the Julian Period ;

“ 7371 – 72 of the Byzantine era ;

“ 5623 – 24 of the Jewish era ;

“ 2616 since the foundation of Rome, according to Varro ;

“ 2610 since the beginning of the era of Nabonassar, which has been assigned to Wednesday, the 26th of February, of the 3967th year of the Julian Period, corresponding according to the chronologists to the 747th, and according to the astronomers to the 746th year before the birth of Christ ;

“ 2639 of the Olympiads, or the third year of the 660th Olympiad, commencing in July, 1861, if we fix the era of the Olympiads at $775\frac{1}{2}$ years before Christ, or near the beginning of July of the year 3938 of the Julian Period ;

“ 2175 of the Grecian era, or the era of the Seleucidæ ;

“ 1579 of the era of Diocletian.

The year 1280 of the Mohammedan era, or the era of the Hegira, begins on the 18th of June, 1863.

The first day of January of the year 1863 is the 2,401,507th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	D	Solar Cycle	24
Epact	11	Roman Indiction	6
Lunar Cycle or Golden Number	2	Julian Period	6576

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, &c.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
♁ or ♂	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring signs.	{	1. ♈ Aries.	Autumn signs.	{	7. ♎ Libra.
		2. ♉ Taurus.			8. ♏ Scorpio.
		3. ♊ Gemini.			9. ♐ Sagittarius.
Summer signs.	{	4. ♋ Cancer.	Winter signs.	{	10. ♑ Capricornus.
		5. ♌ Leo.			11. ♒ Aquarius.
		6. ♍ Virgo.			12. ♓ Pisces.

ASPECTS.

♌	Conjunction, or having the same Longitude or Right Ascension.			
☐	Quadrature, or differing 90° in	"	"	"
♌	Opposition, or differing 180° in	"	"	"

ABBREVIATIONS.

♊	Ascending Node.	'	Minutes of Arc.
♋	Descending Node.	"	Seconds of Arc.
N.	North. S. South.	h	Hours.
E.	East. W. West.	m	Minutes of Time.
°	Degrees.	s	Seconds of Time.

ASTRONOMICAL EPHEMERIS

FOR THE USE OF

NAVIGATORS.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
Thur.	1	^h 18 ^m 46 ^s 20.04	11.038	S. 23° 1' 43.1	12.21	16' 18.39	71.08	^m 3 45.11	^s 1.181
Fri.	2	18 50 44.85	11.023	22 56 36.0	13.35	16 18.39	71.03	4 13.26	1.167
Sat.	3	18 55 9.30	11.007	22 51 1.6	14.49	16 18.38	70.98	4 41.10	1.151
Sun.	4	18 59 33.36	10.990	22 45 0.1	15.62	16 18.37	70.93	5 8.54	1.134
Mon.	5	19 3 57.00	10.973	22 38 31.5	16.75	16 18.36	70.88	5 35.55	1.116
Tues.	6	19 8 20.21	10.955	22 31 35.9	17.86	16 18.34	70.81	6 2.12	1.097
Wed.	7	19 12 42.96	10.935	22 24 13.7	18.97	16 18.31	70.74	6 28.24	1.078
Thur.	8	19 17 5.23	10.914	22 16 24.9	20.07	16 18.27	70.67	6 53.88	1.057
Fri.	9	19 21 26.98	10.893	22 8 9.8	21.16	16 18.23	70.60	7 19.01	1.036
Sat.	10	19 25 48.21	10.870	21 59 28.7	22.24	16 18.18	70.52	7 43.62	1.013
Sun.	11	19 30 8.88	10.847	21 50 21.8	23.31	16 18.13	70.43	8 7.67	0.990
Mon.	12	19 34 28.97	10.822	21 40 49.4	24.37	16 18.07	70.35	8 31.14	0.966
Tues.	13	19 38 48.47	10.797	21 30 51.7	25.42	16 18.01	70.27	8 54.02	0.941
Wed.	14	19 43 7.35	10.771	21 20 29.1	26.46	16 17.94	70.19	9 16.29	0.915
Thur.	15	19 47 25.59	10.744	21 9 41.7	27.48	16 17.87	70.11	9 37.92	0.888
Fri.	16	19 51 43.18	10.716	20 58 29.9	28.49	16 17.80	70.02	9 58.89	0.860
Sat.	17	19 56 0.08	10.687	20 46 54.1	29.48	16 17.72	69.92	10 19.17	0.831
Sun.	18	20 0 16.26	10.657	20 34 54.6	30.46	16 17.63	69.82	10 38.74	0.801
Mon.	19	20 4 31.73	10.627	20 22 31.8	31.42	16 17.54	69.72	10 57.60	0.771
Tues.	20	20 8 46.47	10.596	20 9 45.8	32.37	16 17.44	69.62	11 15.74	0.739
Wed.	21	20 13 0.45	10.564	19 56 37.2	33.31	16 17.34	69.52	11 33.11	0.707
Thur.	22	20 17 13.64	10.532	19 43 6.4	34.22	16 17.24	69.41	11 49.70	0.675
Fri.	23	20 21 26.05	10.499	19 29 13.7	35.13	16 17.13	69.30	12 5.51	0.642
Sat.	24	20 25 37.66	10.465	19 14 59.5	36.02	16 17.02	69.19	12 20.52	0.608
Sun.	25	20 29 48.45	10.431	19 0 24.2	36.89	16 16.91	69.08	12 34.72	0.574
Mon.	26	20 33 58.42	10.397	18 45 28.1	37.75	16 16.79	68.97	12 48.09	0.540
Tues.	27	20 38 7.56	10.362	18 30 11.7	38.59	16 16.67	68.86	13 0.63	0.506
Wed.	28	20 42 15.87	10.327	18 14 35.2	39.41	16 16.54	68.75	13 12.35	0.471
Thur.	29	20 46 23.35	10.292	17 58 39.2	40.22	16 16.41	68.64	13 23.25	0.436
Fri.	30	20 50 29.98	10.257	17 42 23.9	41.01	16 16.28	68.52	13 33.30	0.401
Sat.	31	20 54 35.76	10.222	17 25 49.8	41.79	16 16.14	68.41	13 42.50	0.366
Sun.	32	20 58 40.70	10.188	S. 17 8 57.3	42.55	16 15.99	68.30	13 50.86	0.331

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Thur.	1	^h 18 ^m 46 ^s 19.34	11.038	S. 23° 1' 43.8	12.21	^m 3 ^s 45.04	1.181	^h 18 ^m 42 ^s 34.30
Fri.	2	18 50 44.07	11.023	22 56 37.0	13.35	4 13.21	1.167	18 46 30.86
Sat.	3	18 55 8.44	11.007	22 51 2.8	14.49	4 41.02	1.151	18 50 27.42
Sun.	4	18 59 32.42	10.990	22 45 1.5	15.62	5 8.45	1.134	18 54 23.97
Mon.	5	19 3 55.98	10.973	22 38 33.1	16.75	5 35.45	1.116	18 58 20.53
Tues.	6	19 8 19.11	10.955	22 31 37.7	17.86	6 2.02	1.097	19 2 17.09
Wed.	7	19 12 41.78	10.935	22 24 15.7	18.97	6 28.14	1.078	19 6 13.64
Thur.	8	19 17 3.97	10.914	22 16 27.2	20.07	6 53.77	1.057	19 10 10.20
Fri.	9	19 21 25.65	10.893	22 8 12.4	21.16	7 18.89	1.036	19 14 6.76
Sat.	10	19 25 46.81	10.870	21 59 31.6	22.24	7 43.49	1.013	19 18 3.32
Sun.	11	19 30 7.41	10.847	21 50 25.0	23.31	8 7.54	0.990	19 21 59.87
Mon.	12	19 34 27.43	10.822	21 40 52.9	24.37	8 31.00	0.966	19 25 56.43
Tues.	13	19 38 46.87	10.797	21 30 55.5	25.42	8 53.88	0.941	19 29 52.99
Wed.	14	19 43 5.69	10.771	21 20 33.2	26.46	9 16.15	0.915	19 33 49.54
Thur.	15	19 47 23.87	10.744	21 9 46.1	27.48	9 37.78	0.888	19 37 46.09
Fri.	16	19 51 41.40	10.716	20 58 34.6	28.49	9 58.75	0.860	19 41 42.65
Sat.	17	19 55 58.24	10.687	20 46 59.1	29.48	10 19.03	0.831	19 45 39.21
Sun.	18	20 0 14.37	10.657	20 34 59.9	30.46	10 38.60	0.801	19 49 35.77
Mon.	19	20 4 29.79	10.627	20 22 37.4	31.42	10 57.46	0.771	19 53 32.33
Tues.	20	20 8 44.48	10.596	20 9 51.8	32.37	11 15.60	0.739	19 57 28.88
Wed.	21	20 12 58.41	10.564	19 56 43.5	33.31	11 32.97	0.707	20 1 25.44
Thur.	22	20 17 11.56	10.532	19 43 13.0	34.22	11 49.56	0.675	20 5 22.00
Fri.	23	20 21 23.93	10.499	19 29 20.6	35.13	12 5.38	0.642	20 9 18.55
Sat.	24	20 25 35.50	10.465	19 15 6.8	36.02	12 20.39	0.608	20 13 15.11
Sun.	25	20 29 46.26	10.431	19 0 31.9	36.89	12 34.60	0.574	20 17 11.66
Mon.	26	20 33 56.20	10.397	18 45 36.2	37.75	12 47.98	0.540	20 21 8.22
Tues.	27	20 38 5.31	10.362	18 30 20.1	38.59	13 0.53	0.506	20 25 4.78
Wed.	28	20 42 13.59	10.327	18 14 43.9	39.41	13 12.26	0.471	20 29 1.33
Thur.	29	20 46 21.05	10.292	17 58 48.2	40.22	13 23.16	0.436	20 32 57.89
Fri.	30	20 50 27.66	10.257	17 42 33.2	41.01	13 33.21	0.401	20 36 54.45
Sat.	31	20 54 33.42	10.222	17 25 59.4	41.79	13 42.42	0.366	20 40 51.00
Sun.	32	20 58 38.34	10.188	S. 17 9 7.2	42.55	13 50.79	0.331	20 44 47.55

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE				
		λ	λ'						
1	1	280° 39' 7.7"	38' 50.3"	152.86	+0.11	9.9926596	0.7	5 ^h 16 ^m 33.70 ^s	
2	2	281 40 16.1	39 58.5	152.85	—0.02	.9926592	0.4	5 12 37.79	
3	3	282 41 24.4	41 6.6	152.84	0.16	.9926615	1.6	5 8 41.88	
4	4	283 42 32.6	42 14.6	152.83	0.28	.9926667	2.8	5 4 45.97	
5	5	284 43 40.6	43 22.5	152.83	0.41	.9926748	4.0	5 0 50.05	
6	6	285 44 48.5	44 30.2	152.83	0.51	.9926858	5.2	4 56 54.14	
7	7	286 45 56.3	45 37.8	152.83	0.60	.9926996	6.3	4 52 58.23	
8	8	287 47 4.1	46 45.4	152.82	0.65	.9927162	7.4	4 49 2.32	
9	9	288 48 11.7	47 52.8	152.81	0.67	.9927353	8.5	4 45 6.41	
10	10	289 49 19.2	49 0.2	152.81	0.66	.9927570	9.6	4 41 10.49	
11	11	290 50 26.7	50 7.5	152.81	0.62	.9927812	10.6	4 37 14.58	
12	12	291 51 34.2	51 14.8	152.81	0.54	.9928078	11.5	4 33 18.67	
13	13	292 52 41.4	52 21.8	152.80	0.45	.9928366	12.4	4 29 22.76	
14	14	293 53 48.4	53 28.7	152.79	0.35	.9928675	13.2	4 25 26.85	
15	15	294 54 55.2	54 35.4	152.78	0.24	.9929003	14.0	4 21 30.94	
16	16	295 56 1.7	55 41.7	152.77	—0.12	.9929349	14.8	4 17 35.03	
17	17	296 57 7.9	56 47.7	152.75	+0.01	.9929712	15.5	4 13 39.12	
18	18	297 58 13.7	57 53.3	152.73	0.13	.9930091	16.2	4 9 43.21	
19	19	298 59 18.9	58 58.4	152.70	0.23	.9930487	16.9	4 5 47.30	
20	20	300 0 23.4	0 2.8	152.67	0.32	.9930899	17.5	4 1 51.39	
21	21	301 1 27.1	1 6.3	152.64	0.39	.9931325	18.1	3 57 55.48	
22	22	302 2 29.9	2 8.9	152.60	0.41	.9931765	18.7	3 53 59.57	
23	23	303 3 31.8	3 10.7	152.56	0.41	.9932220	19.3	3 50 3.66	
24	24	304 4 32.7	4 11.5	152.52	0.38	.9932693	19.9	3 46 7.75	
25	25	305 5 32.5	5 11.2	152.47	0.32	.9933184	20.8	3 42 11.84	
26	26	306 6 31.1	6 9.6	152.42	0.24	.9933694	21.6	3 38 15.93	
27	27	307 7 28.5	7 6.8	152.36	0.13	.9934223	22.4	3 34 20.02	
28	28	308 8 24.6	8 2.8	152.31	+0.01	.9934773	23.3	3 30 24.11	
29	29	309 9 19.5	8 57.6	152.26	—0.13	.9935343	24.2	3 26 28.20	
30	30	310 10 13.1	9 51.1	152.21	0.26	.9935934	25.2	3 22 32.29	
31	31	311 11 5.4	10 43.2	152.16	0.39	.9936550	26.2	3 18 36.38	
32	32	312 11 56.4	11 34.0	152.11	—0.52	9.9937190	27.2	3 14 40.47	

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	14 47.7	14 46.1	54 11.0	-0.55	54 5.4	-0.40	9 31.6	2.04	11.3
2	14 45.1	14 44.3	54 1.5	0.27	53 59.1	-0.14	10 20.5	2.04	12.3
3	14 43.9	14 44.0	53 58.1	-0.02	53 58.6	+0.09	11 9.3	2.02	13.3
4	14 44.7	14 45.6	54 0.3	+0.20	54 3.3	0.30	11 57.4	1.97	14.3
5	14 46.8	14 48.2	54 7.6	0.40	54 13.0	0.50	12 44.4	1.92	15.3
6	14 50.0	14 52.2	54 19.6	0.60	54 27.3	0.70	13 29.9	1.87	16.3
7	14 54.6	14 57.4	54 36.3	0.80	54 46.6	0.91	14 14.2	1.83	17.3
8	15 0.5	15 4.0	54 58.1	1.02	55 11.1	1.14	14 57.7	1.81	18.3
9	15 7.9	15 12.2	55 25.5	1.26	55 41.2	1.38	15 41.2	1.83	19.3
10	15 16.9	15 22.0	55 58.5	1.49	56 17.1	1.61	16 25.5	1.88	20.3
11	15 27.5	15 33.3	56 37.2	1.73	56 58.6	1.84	17 11.5	1.98	21.3
12	15 39.4	15 45.9	57 21.2	1.92	57 44.9	2.00	18 0.3	2.13	22.3
13	15 52.6	15 59.3	58 9.4	2.05	58 34.1	2.08	18 53.4	2.28	23.3
14	16 6.1	16 12.7	58 59.1	2.06	59 23.5	1.99	19 49.9	2.44	24.3
15	16 19.1	16 25.0	59 46.8	1.88	60 8.5	1.70	20 50.4	2.58	25.3
16	16 30.2	16 34.6	60 27.6	1.47	60 43.8	1.20	21 53.6	2.63	26.3
17	16 38.0	16 40.3	60 56.4	0.88	61 4.9	+0.52	22 56.8	2.50	27.3
18	16 41.5	16 41.2	61 8.8	+0.13	61 8.1	-0.26	23 58.1	2.49	28.3
19	16 39.7	16 37.0	61 2.7	-0.65	60 52.5	1.03	♄		29.3
20	16 33.0	16 28.0	60 37.9	1.38	60 19.4	1.69	0 56.1	2.34	0.8
21	16 22.1	16 15.3	59 57.5	1.94	59 32.8	2.14	1 50.4	2.20	1.8
22	16 7.9	16 0.3	59 6.0	2.29	58 37.9	2.37	2 41.5	2.08	2.8
23	15 52.5	15 44.6	58 9.1	2.40	57 40.3	2.38	3 30.2	2.00	3.8
24	15 36.9	15 29.5	57 12.1	2.31	56 44.8	2.20	4 17.3	1.96	4.8
25	15 22.6	15 16.0	56 19.2	2.07	55 55.2	1.91	5 4.4	1.93	5.8
26	15 10.1	15 4.9	55 33.4	1.73	55 13.8	1.53	5 51.6	1.97	6.8
27	15 0.1	14 56.1	54 56.6	1.33	54 41.8	1.13	6 39.0	1.99	7.8
28	14 52.7	14 50.0	54 29.5	0.93	54 20.0	0.73	7 27.2	2.02	8.8
29	14 47.9	14 46.6	54 12.0	0.53	54 6.8	-0.34	8 16.0	2.03	9.8
30	14 45.7	14 45.5	54 3.9	-0.16	54 2.9	0.00	9 4.8	2.02	10.8
31	14 45.8	14 46.5	54 4.0	+0.16	54 6.8	+0.30	9 53.2	2.00	11.8
32	14 47.7	14 49.3	54 11.2	+0.43	54 17.1	+0.55	10 40.7	1.95	12.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 1.					SATURDAY 3.				
0	3 55 27.91	2.1181	N 21° 44' 53.1	2.516	0	5 37 51.81	2.1331	N 22° 33' 2.5	1.537
1	3 57 35.03	2.1192	21 48 21.0	2.414	1	5 39 59.77	2.1323	22 31 27.1	1.543
2	3 59 42.22	2.1204	21 51 42.7	2.311	2	5 42 7.68	2.1316	22 29 45.4	1.747
3	4 1 49.49	2.1217	21 54 58.2	2.208	3	5 44 15.55	2.1308	22 27 57.4	1.862
4	4 3 56.82	2.1227	21 58 7.6	2.106	4	5 46 23.38	2.1300	22 26 3.1	1.966
5	4 6 4.21	2.1238	22 1 10.9	2.004	5	5 48 31.15	2.1290	22 24 2.5	2.063
6	4 8 11.67	2.1249	22 4 8.0	2.901	6	5 50 38.85	2.1281	22 21 55.6	2.167
7	4 10 19.19	2.1267	22 6 58.9	2.796	7	5 52 46.51	2.1271	22 19 42.4	2.271
8	4 12 26.76	2.1267	22 9 43.6	2.692	8	5 54 54.11	2.1261	22 17 23.0	2.375
9	4 14 34.39	2.1278	22 12 22.0	2.588	9	5 57 1.64	2.1251	22 14 57.4	2.479
10	4 16 42.08	2.1286	22 14 54.2	2.484	10	5 59 9.12	2.1240	22 12 25.5	2.583
11	4 18 49.82	2.1293	22 17 20.1	2.380	11	6 1 16.53	2.1238	22 9 47.4	2.687
12	4 20 57.60	2.1301	22 19 39.8	2.276	12	6 3 23.86	2.1218	22 7 3.1	2.790
13	4 23 5.43	2.1309	22 21 53.3	2.171	13	6 5 31.13	2.1206	22 4 12.6	2.891
14	4 25 13.31	2.1317	22 24 0.5	2.066	14	6 7 38.32	2.1192	22 1 16.1	2.992
15	4 27 21.23	2.1324	22 26 1.3	1.962	15	6 9 45.43	2.1179	21 58 13.6	3.094
16	4 29 29.19	2.1330	22 27 55.8	1.857	16	6 11 52.47	2.1166	21 55 4.9	3.197
17	4 31 37.19	2.1336	22 29 44.0	1.753	17	6 13 59.42	2.1152	21 51 50.0	3.300
18	4 33 45.22	2.1342	22 31 26.0	1.648	18	6 16 6.29	2.1139	21 48 28.9	3.401
19	4 35 53.29	2.1349	22 33 1.6	1.540	19	6 18 13.08	2.1124	21 45 1.8	3.501
20	4 38 1.40	2.1356	22 34 30.8	1.435	20	6 20 19.78	2.1109	21 41 28.7	3.601
21	4 40 9.55	2.1361	22 35 53.7	1.329	21	6 22 26.39	2.1094	21 37 49.6	3.701
22	4 42 17.73	2.1366	22 37 10.3	1.223	22	6 24 32.91	2.1080	21 34 4.5	3.801
23	4 44 25.93	2.1368	N 22° 38' 20.5	1.117	23	6 26 39.34	2.1064	N 21° 30' 13.4	3.900
FRIDAY 2.					SUNDAY 4.				
0	4 46 34.15	2.1373	N 22° 39' 24.3	1.011	0	6 28 45.67	2.1046	N 21° 26' 16.4	4.000
1	4 48 42.40	2.1376	22 40 21.8	0.906	1	6 30 51.90	2.1039	21 22 13.5	4.099
2	4 50 50.66	2.1378	22 41 12.9	0.799	2	6 32 58.03	2.1015	21 18 4.7	4.196
3	4 52 58.94	2.1381	22 41 57.6	0.693	3	6 35 4.07	2.0999	21 13 50.0	4.294
4	4 55 7.24	2.1384	22 42 36.0	0.586	4	6 37 10.01	2.0980	21 9 29.4	4.392
5	4 57 15.55	2.1386	22 43 8.0	0.479	5	6 39 15.84	2.0964	21 5 2.9	4.489
6	4 59 23.86	2.1388	22 43 33.5	0.373	6	6 41 21.56	2.0946	21 0 30.6	4.587
7	5 1 32.17	2.1386	22 43 52.7	0.266	7	6 43 27.18	2.0927	20 55 52.4	4.685
8	5 3 40.49	2.1386	22 44 5.5	0.160	8	6 45 32.69	2.0906	20 51 8.5	4.781
9	5 5 48.80	2.1386	22 44 11.9	0.053	9	6 47 38.08	2.0891	20 46 18.8	4.877
10	5 7 57.12	2.1386	22 44 11.9	0.054	10	6 49 43.37	2.0873	20 41 23.3	4.971
11	5 10 5.43	2.1384	22 44 5.5	0.160	11	6 51 48.54	2.0853	20 36 22.2	5.066
12	5 12 13.73	2.1384	22 43 52.7	0.266	12	6 53 53.60	2.0838	20 31 15.5	5.160
13	5 14 22.03	2.1382	22 43 33.6	0.373	13	6 55 58.54	2.0813	20 26 3.1	5.253
14	5 16 30.31	2.1379	22 43 8.1	0.479	14	6 58 3.36	2.0794	20 20 45.1	5.346
15	5 18 38.57	2.1376	22 42 36.1	0.585	15	7 0 8.07	2.0776	20 15 21.6	5.439
16	5 20 46.82	2.1373	22 41 57.8	0.691	16	7 2 12.66	2.0758	20 9 52.5	5.533
17	5 22 55.05	2.1370	22 41 13.1	0.797	17	7 4 17.12	2.0738	20 4 17.8	5.624
18	5 25 3.25	2.1366	22 40 22.1	0.904	18	7 6 21.46	2.0718	19 58 37.6	5.717
19	5 27 11.43	2.1361	22 39 24.7	1.010	19	7 8 25.68	2.0699	19 52 51.9	5.808
20	5 29 19.58	2.1356	22 38 20.9	1.116	20	7 10 29.77	2.0672	19 47 0.8	5.895
21	5 31 27.69	2.1349	22 37 10.8	1.223	21	7 12 33.74	2.0650	19 41 4.4	5.986
22	5 33 35.76	2.1343	22 35 54.3	1.327	22	7 14 37.58	2.0628	19 35 2.6	6.076
23	5 35 43.80	2.1337	22 34 31.5	1.432	23	7 16 41.29	2.0607	19 28 55.4	6.166
24	5 37 51.81	2.1331	N 22° 33' 2.5	1.537	24	7 18 44.87	2.0586	N 19° 22' 42.8	6.256

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 5.					WEDNESDAY 7.				
0	7 18 44.87	2.0686	N.19 22 42.8	6.366	0	8 55 3.59	1.9678	N.12 51 53.7	9.791
1	7 20 48.32	2.0686	19 16 24.9	6.345	1	8 57 1.01	1.9661	12 42 4.5	9.860
2	7 22 51.65	2.0644	19 10 1.8	6.487	2	8 58 58.33	1.9645	12 32 11.8	9.907
3	7 24 54.85	2.0623	19 3 33.6	6.514	3	9 0 55.55	1.9628	12 22 15.7	9.953
4	7 26 57.91	2.0600	18 57 0.1	6.602	4	9 2 52.47	1.9613	12 12 16.2	10.019
5	7 29 0.84	2.0478	18 50 21.4	6.689	5	9 4 49.70	1.9486	12 2 13.4	10.076
6	7 31 3.65	2.0456	18 43 37.5	6.773	6	9 6 46.64	1.9482	11 52 7.2	10.130
7	7 33 6.32	2.0434	18 36 48.6	6.867	7	9 8 43.48	1.9465	11 41 57.8	10.183
8	7 35 8.86	2.0411	18 29 54.8	6.939	8	9 10 40.23	1.9451	11 31 45.2	10.236
9	7 37 11.26	2.0388	18 22 56.0	7.021	9	9 12 36.89	1.9436	11 21 29.4	10.290
10	7 39 13.52	2.0366	18 15 52.3	7.104	10	9 14 33.46	1.9421	11 11 10.4	10.343
11	7 41 15.65	2.0344	18 8 43.6	7.187	11	9 16 29.94	1.9405	11 0 48.3	10.398
12	7 43 17.65	2.0323	18 1 29.9	7.270	12	9 18 26.33	1.9391	10 50 23.1	10.444
13	7 45 19.51	2.0299	17 54 11.3	7.350	13	9 20 22.63	1.9378	10 39 55.0	10.494
14	7 47 21.24	2.0277	17 46 47.9	7.431	14	9 22 18.86	1.9366	10 29 23.9	10.542
15	7 49 22.85	2.0256	17 39 19.6	7.511	15	9 24 15.03	1.9353	10 18 50.0	10.589
16	7 51 24.31	2.0233	17 31 46.5	7.591	16	9 26 11.12	1.9341	10 8 13.2	10.637
17	7 53 25.64	2.0211	17 24 8.7	7.669	17	9 28 7.14	1.9330	9 57 33.5	10.685
18	7 55 26.85	2.0189	17 16 26.3	7.747	18	9 30 3.08	1.9320	9 46 50.9	10.733
19	7 57 27.92	2.0168	17 8 39.1	7.825	19	9 31 58.98	1.9310	9 36 5.6	10.779
20	7 59 28.86	2.0144	17 0 47.3	7.901	20	9 33 54.82	1.9300	9 25 17.6	10.823
21	8 1 29.67	2.0131	16 52 51.0	7.977	21	9 35 50.59	1.9290	9 14 26.9	10.867
22	8 3 30.34	2.0099	16 44 50.1	8.052	22	9 37 46.29	1.9280	9 3 33.5	10.913
23	8 5 30.87	2.0077	N.16 36 44.7	8.128	23	9 39 41.93	1.9270	N. 8 52 37.5	10.955
TUESDAY 6.					THURSDAY 8.				
0	8 7 31.26	2.0055	N.16 28 34.8	8.199	0	9 41 37.51	1.9260	N. 8 41 39.0	10.998
1	8 9 31.52	2.0033	16 20 20.5	8.275	1	9 43 33.05	1.9250	8 30 38.1	11.037
2	8 11 31.65	2.0010	16 12 1.8	8.349	2	9 45 28.54	1.9245	8 19 34.7	11.078
3	8 13 31.66	1.9989	16 3 38.7	8.421	3	9 47 23.99	1.9237	8 8 28.8	11.118
4	8 15 31.53	1.9968	15 55 11.3	8.493	4	9 49 19.38	1.9229	7 57 20.5	11.157
5	8 17 31.28	1.9948	15 46 39.6	8.566	5	9 51 14.73	1.9221	7 46 9.9	11.196
6	8 19 30.91	1.9926	15 38 3.5	8.638	6	9 53 10.03	1.9214	7 34 56.9	11.234
7	8 21 30.40	1.9906	15 29 23.2	8.709	7	9 55 5.30	1.9209	7 23 41.7	11.272
8	8 23 29.77	1.9886	15 20 38.9	8.774	8	9 57 0.54	1.9205	7 12 24.3	11.309
9	8 25 29.03	1.9866	15 11 50.5	8.843	9	9 58 55.76	1.9200	7 1 4.7	11.346
10	8 27 28.16	1.9845	15 2 57.9	8.913	10	10 0 50.95	1.9196	6 49 42.9	11.383
11	8 29 27.17	1.9825	14 54 1.2	8.978	11	10 2 46.12	1.9190	6 38 19.0	11.416
12	8 31 26.05	1.9804	14 45 0.5	9.044	12	10 4 41.27	1.9180	6 26 53.0	11.450
13	8 33 24.82	1.9784	14 35 55.9	9.109	13	10 6 36.40	1.9180	6 15 25.0	11.483
14	8 35 23.47	1.9764	14 26 47.4	9.174	14	10 8 31.52	1.9186	6 3 55.1	11.516
15	8 37 21.99	1.9743	14 17 35.0	9.240	15	10 10 26.63	1.9184	5 52 23.4	11.546
16	8 39 20.39	1.9724	14 8 18.7	9.304	16	10 12 21.73	1.9188	5 40 49.7	11.577
17	8 41 18.68	1.9706	13 58 58.6	9.369	17	10 14 16.83	1.9183	5 29 14.1	11.608
18	8 43 16.86	1.9686	13 49 34.6	9.433	18	10 16 11.93	1.9180	5 17 36.7	11.638
19	8 45 14.92	1.9667	13 40 6.8	9.493	19	10 18 7.02	1.9182	5 5 57.6	11.668
20	8 47 12.87	1.9649	13 30 35.4	9.554	20	10 20 2.11	1.9188	4 54 16.8	11.694
21	8 49 10.71	1.9631	13 21 0.5	9.615	21	10 21 57.22	1.9184	4 42 34.3	11.723
22	8 51 8.44	1.9614	13 11 21.8	9.676	22	10 23 52.33	1.9186	4 30 50.1	11.749
23	8 53 6.07	1.9596	13 1 39.5	9.734	23	10 25 47.46	1.9189	4 19 4.3	11.775
24	8 55 3.59	1.9578	N.12 51 53.7	9.791	24	10 27 42.60	1.9191	N. 4 7 17.0	11.800

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 9.					SUNDAY 11.				
0	10 ^h 27 ^m 42.60 ^s	1.9191	N. 4° 7' 17.0"	11.900	0	12 ^h 1 ^m 18.15 ^s	2.0045	S. 5° 33' 54.8"	12.107
1	10 29 37.76	1.9196	3 55 28.2	11.926	1	12 3 18.52	2.0080	5 46 0.8	12.092
2	10 31 32.95	1.9201	3 43 38.0	11.848	2	12 5 19.10	2.0113	5 58 5.9	12.078
3	10 33 28.17	1.9206	3 31 46.5	11.870	3	12 7 19.89	2.0148	6 10 10.1	12.062
4	10 35 23.41	1.9210	3 19 53.6	11.893	4	12 9 20.88	2.0184	6 22 13.4	12.046
5	10 37 18.69	1.9215	3 7 59.3	11.916	5	12 11 22.09	2.0220	6 34 15.6	12.028
6	10 39 14.01	1.9222	2 56 3.6	11.938	6	12 13 23.51	2.0256	6 46 16.6	12.008
7	10 41 9.36	1.9228	2 44 6.7	11.968	7	12 15 25.16	2.0294	6 58 16.5	11.988
8	10 43 4.76	1.9236	2 32 8.6	11.978	8	12 17 27.04	2.0333	7 10 15.2	11.968
9	10 45 0.20	1.9243	2 20 9.4	11.996	9	12 19 29.15	2.0372	7 22 12.6	11.947
10	10 46 55.69	1.9253	2 8 9.2	12.014	10	12 21 31.50	2.0412	7 34 8.8	11.926
11	10 48 51.24	1.9262	1 56 7.9	12.030	11	12 23 34.09	2.0452	7 46 3.6	11.903
12	10 50 46.84	1.9272	1 44 5.7	12.046	12	12 25 36.92	2.0492	7 57 57.0	11.877
13	10 52 42.50	1.9282	1 32 2.5	12.061	13	12 27 40.00	2.0534	8 9 48.8	11.849
14	10 54 38.23	1.9292	1 19 58.3	12.075	14	12 29 43.34	2.0576	8 21 38.9	11.822
15	10 56 34.03	1.9306	1 7 53.3	12.090	15	12 31 46.93	2.0619	8 33 27.3	11.793
16	10 58 29.91	1.9319	0 55 47.4	12.104	16	12 33 50.77	2.0663	8 45 14.0	11.763
17	11 0 25.87	1.9332	0 43 40.7	12.117	17	12 35 54.88	2.0707	8 56 58.9	11.733
18	11 2 21.90	1.9345	0 31 33.3	12.129	18	12 37 59.25	2.0750	9 8 42.0	11.702
19	11 4 18.01	1.9358	0 19 25.2	12.141	19	12 40 3.88	2.0795	9 20 23.3	11.671
20	11 6 14.20	1.9372	N. 0° 7' 16.5"	12.151	20	12 42 8.79	2.0841	9 32 2.6	11.639
21	11 8 10.48	1.9387	S. 0 4 52.9	12.161	21	12 44 13.98	2.0888	9 43 39.9	11.606
22	11 10 6.85	1.9404	0 17 2.9	12.170	22	12 46 19.45	2.0936	9 55 15.1	11.569
23	11 12 3.32	1.9420	S. 0 29 13.4	12.179	23	12 48 25.21	2.0984	S. 10 6 48.2	11.534
SATURDAY 10.					MONDAY 12.				
0	11 13 59.89	1.9438	S. 0 41 24.3	12.186	0	12 50 31.25	2.1032	S. 10 18 19.1	11.497
1	11 15 56.57	1.9456	0 53 35.6	12.191	1	12 52 37.59	2.1081	10 29 47.7	11.457
2	11 17 53.36	1.9474	1 5 47.3	12.196	2	12 54 44.23	2.1132	10 41 13.8	11.416
3	11 19 50.26	1.9493	1 17 59.3	12.201	3	12 56 51.17	2.1182	10 52 37.4	11.373
4	11 21 47.28	1.9513	1 30 11.5	12.206	4	12 58 58.41	2.1232	11 3 58.5	11.331
5	11 23 44.42	1.9533	1 42 23.9	12.209	5	13 1 5.96	2.1284	11 15 17.1	11.289
6	11 25 41.68	1.9554	1 54 36.5	12.212	6	13 3 13.82	2.1336	11 26 33.1	11.246
7	11 27 39.07	1.9576	2 6 49.3	12.214	7	13 5 21.98	2.1388	11 37 46.4	11.201
8	11 29 36.59	1.9598	2 19 2.2	12.216	8	13 7 30.47	2.1442	11 48 57.0	11.158
9	11 31 34.25	1.9622	2 31 15.1	12.214	9	13 9 39.28	2.1496	12 0 4.7	11.106
10	11 33 32.06	1.9646	2 43 27.9	12.212	10	13 11 48.42	2.1551	12 11 9.5	11.063
11	11 35 30.01	1.9670	2 55 40.5	12.209	11	13 13 57.89	2.1606	12 22 11.2	11.008
12	11 37 28.10	1.9694	3 7 53.0	12.207	12	13 16 7.70	2.1663	12 33 9.8	10.960
13	11 39 26.34	1.9720	3 20 5.4	12.206	13	13 18 17.84	2.1719	12 44 5.3	10.907
14	11 41 24.74	1.9746	3 32 17.6	12.201	14	13 20 28.32	2.1775	12 54 57.3	10.848
15	11 43 23.30	1.9773	3 44 29.5	12.196	15	13 22 39.13	2.1831	13 5 46.3	10.787
16	11 45 22.02	1.9801	3 56 41.1	12.189	16	13 24 50.29	2.1889	13 16 31.8	10.730
17	11 47 20.91	1.9828	4 8 52.2	12.182	17	13 27 1.80	2.1947	13 27 13.9	10.672
18	11 49 19.97	1.9857	4 21 2.8	12.174	18	13 29 13.66	2.2006	13 37 52.5	10.613
19	11 51 19.19	1.9887	4 33 13.0	12.167	19	13 31 25.87	2.2066	13 48 27.5	10.553
20	11 53 18.60	1.9917	4 45 22.7	12.166	20	13 33 38.44	2.2125	13 58 58.8	10.491
21	11 55 18.20	1.9949	4 57 31.8	12.147	21	13 35 51.37	2.2185	14 9 26.3	10.427
22	11 57 17.99	1.9981	5 9 40.3	12.136	22	13 38 4.65	2.2246	14 19 49.9	10.363
23	11 59 17.97	2.0014	5 21 48.0	12.121	23	13 40 18.30	2.2306	14 30 9.6	10.296
24	12 1 18.15	2.0046	S. 5 33 54.8	12.107	24	13 42 32.32	2.2368	S. 14 40 25.4	10.227

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 13.					THURSDAY 15.				
0	13 ^h 42 ^m 32.32 ^s	2.2308	S. 14° 40' 25.4"	10.227	0	15 ^h 37 ^m 23.78 ^s	2.5478	S. 21° 6' 58.9"	5.322
1	13 44 46.72	2.2491	14 50 36.9	10.187	1	15 39 56.79	2.5581	21 12 14.0	5.183
2	13 47 1.49	2.2493	15 0 44.2	10.087	2	15 42 30.14	2.5686	21 17 20.8	5.043
3	13 49 16.63	2.2544	15 10 47.4	10.017	3	15 45 3.84	2.5645	21 22 19.2	4.903
4	13 51 32.14	2.2616	15 20 46.3	9.945	4	15 47 37.89	2.5701	21 27 9.2	4.763
5	13 53 48.03	2.2680	15 30 40.7	9.871	5	15 50 12.25	2.5766	21 31 50.7	4.621
6	13 56 4.30	2.2744	15 40 30.7	9.796	6	15 52 46.96	2.5810	21 36 23.6	4.477
7	13 58 20.96	2.2808	15 50 16.1	9.718	7	15 55 22.00	2.5864	21 40 47.9	4.333
8	14 0 38.00	2.2873	15 59 56.8	9.640	8	15 57 57.35	2.5917	21 45 3.5	4.188
9	14 2 55.42	2.2936	16 9 32.8	9.561	9	16 0 33.00	2.5969	21 49 10.3	4.042
10	14 5 13.23	2.3000	16 19 4.1	9.480	10	16 3 8.97	2.6019	21 53 8.3	3.898
11	14 7 31.43	2.3066	16 28 30.4	9.397	11	16 5 45.23	2.6069	21 56 57.3	3.743
12	14 9 50.03	2.3132	16 37 51.7	9.312	12	16 8 21.79	2.6117	22 0 37.3	3.591
13	14 12 9.03	2.3198	16 47 7.8	9.226	13	16 10 58.63	2.6163	22 4 8.1	3.437
14	14 14 28.42	2.3265	16 56 18.6	9.136	14	16 13 35.75	2.6209	22 7 29.7	3.283
15	14 16 48.21	2.3330	17 5 24.1	9.048	15	16 16 13.14	2.6256	22 10 42.0	3.129
16	14 19 8.39	2.3397	17 14 24.3	8.960	16	16 18 50.82	2.6300	22 13 45.1	2.975
17	14 21 28.97	2.3463	17 23 19.3	8.873	17	16 21 28.75	2.6346	22 16 39.0	2.821
18	14 23 49.95	2.3530	17 32 8.9	8.780	18	16 24 6.96	2.6389	22 19 23.6	2.665
19	14 26 11.33	2.3597	17 40 53.0	8.686	19	16 26 45.45	2.6432	22 21 58.8	2.508
20	14 28 33.11	2.3665	17 49 31.3	8.590	20	16 29 24.17	2.6474	22 24 24.4	2.349
21	14 30 55.30	2.3733	17 58 3.8	8.494	21	16 32 3.13	2.6514	22 26 40.5	2.190
22	14 33 17.90	2.3800	18 6 30.6	8.396	22	16 34 42.34	2.6552	22 28 47.1	2.029
23	14 35 40.90	2.3868	S. 18 14 51.5	8.297	23	16 37 21.76	2.6588	S. 22 30 44.0	1.868
WEDNESDAY 14.					FRIDAY 16.				
0	14 38 4.29	2.3930	S. 18 23 6.4	8.195	0	16 40 1.39	2.6623	S. 22 32 31.3	1.706
1	14 40 28.06	2.3996	18 31 14.9	8.091	1	16 42 41.22	2.6666	22 34 8.8	1.543
2	14 42 52.24	2.4063	18 39 17.2	7.986	2	16 45 21.24	2.6698	22 35 36.4	1.380
3	14 45 16.82	2.4129	18 47 12.8	7.881	3	16 48 1.46	2.6730	22 36 54.2	1.215
4	14 47 41.79	2.4196	18 55 2.6	7.774	4	16 50 41.87	2.6760	22 38 2.2	1.050
5	14 50 7.17	2.4264	19 2 45.7	7.665	5	16 53 22.45	2.6787	22 39 0.2	0.884
6	14 52 32.95	2.4331	19 10 22.3	7.555	6	16 56 3.19	2.6806	22 39 48.2	0.718
7	14 54 50.14	2.4399	19 17 52.3	7.445	7	16 58 44.11	2.6833	22 40 26.3	0.552
8	14 57 25.72	2.4464	19 25 15.6	7.333	8	17 1 25.18	2.6858	22 40 54.4	0.386
9	14 59 52.71	2.4531	19 32 32.2	7.220	9	17 4 6.39	2.6881	22 41 12.4	0.217
10	15 2 20.09	2.4598	19 39 41.9	7.103	10	17 6 47.75	2.6904	22 41 20.4	0.050
11	15 5 47.88	2.4664	19 46 44.5	6.984	11	17 9 29.24	2.6925	22 41 18.3	0.120
12	15 7 16.06	2.4731	19 53 39.9	6.863	12	17 12 10.84	2.6943	22 41 6.0	0.290
13	15 9 44.64	2.4796	20 0 28.0	6.741	13	17 14 52.55	2.6960	22 40 43.6	0.458
14	15 12 13.60	2.4859	20 7 8.8	6.619	14	17 17 34.35	2.6976	22 40 11.1	0.626
15	15 14 42.96	2.4923	20 13 42.3	6.497	15	17 20 16.23	2.6988	22 39 28.5	0.796
16	15 17 12.67	2.4986	20 20 8.4	6.373	16	17 22 58.20	2.7001	22 38 35.7	0.966
17	15 19 42.77	2.5048	20 26 27.0	6.246	17	17 25 40.24	2.7013	22 37 32.6	1.137
18	15 22 13.24	2.5110	20 32 37.9	6.118	18	17 28 22.35	2.7023	22 36 19.2	1.308
19	15 24 44.09	2.5171	20 38 41.2	5.990	19	17 31 4.51	2.7031	22 34 55.6	1.478
20	15 27 15.29	2.5233	20 44 36.7	5.860	20	17 33 46.71	2.7038	22 33 21.8	1.648
21	15 29 46.88	2.5294	20 50 24.3	5.739	21	17 36 28.96	2.7044	22 31 37.8	1.819
22	15 32 18.83	2.5356	20 56 4.1	5.616	22	17 39 11.24	2.7049	22 29 43.5	1.990
23	15 34 51.14	2.5417	21 1 35.6	5.490	23	17 41 53.54	2.7061	22 27 39.0	2.160
24	15 37 23.78	2.5478	S. 21 6 58.9	5.322	24	17 44 35.85	2.7062	S. 22 25 24.3	2.329

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 17.					MONDAY 19.				
0	^h 17 ^m 44 ^s 35.85	2.7082	S. 22° 25' 24.3"	2.329	0	^h 19 ^m 51 ^s 52.23	2.5549	S. 17° 30' 10.7"	9.587
1	17 47 18.15	2.7049	22 22 59.6	2.497	1	19 54 25.36	2.5496	17 20 33.7	9.676
2	17 50 0.43	2.7045	22 20 24.8	2.665	2	19 56 58.17	2.5440	17 10 49.8	9.790
3	17 52 42.69	2.7042	22 17 39.8	2.835	3	19 59 30.65	2.5386	17 0 59.0	9.904
4	17 55 24.93	2.7036	22 14 44.6	3.005	4	20 2 2.81	2.5331	16 51 1.4	10.016
5	17 58 7.12	2.7029	22 11 39.1	3.174	5	20 4 34.63	2.5276	16 40 57.0	10.129
6	18 0 49.26	2.7020	22 8 23.5	3.343	6	20 7 6.11	2.5218	16 30 45.9	10.240
7	18 3 31.35	2.7010	22 4 57.9	3.511	7	20 9 37.25	2.5161	16 20 28.2	10.349
8	18 6 13.37	2.6999	22 1 22.3	3.679	8	20 12 8.05	2.5104	16 10 4.1	10.455
9	18 8 55.32	2.6986	21 57 36.6	3.846	9	20 14 38.50	2.5048	15 59 33.7	10.558
10	18 11 37.19	2.6971	21 53 40.8	4.011	10	20 17 8.62	2.4990	15 48 57.2	10.659
11	18 14 18.97	2.6955	21 49 35.1	4.177	11	20 19 38.39	2.4932	15 38 14.6	10.759
12	18 17 0.65	2.6938	21 45 19.5	4.342	12	20 22 7.81	2.4874	15 27 26.1	10.857
13	18 19 42.23	2.6920	21 40 54.1	4.505	13	20 24 36.88	2.4816	15 16 31.8	10.952
14	18 22 23.69	2.6901	21 36 18.9	4.667	14	20 27 5.60	2.4757	15 5 31.9	11.046
15	18 25 5.03	2.6880	21 31 34.0	4.829	15	20 29 33.98	2.4700	14 54 26.3	11.139
16	18 27 46.23	2.6856	21 26 39.4	4.991	16	20 32 2.01	2.4641	14 43 15.2	11.230
17	18 30 27.28	2.6831	21 21 35.1	5.152	17	20 34 29.69	2.4582	14 31 58.7	11.319
18	18 33 8.19	2.6805	21 16 21.1	5.313	18	20 36 57.01	2.4524	14 20 36.9	11.406
19	18 35 48.94	2.6778	21 10 57.5	5.473	19	20 39 23.98	2.4466	14 9 9.9	11.492
20	18 38 29.52	2.6749	21 5 24.3	5.633	20	20 41 50.60	2.4408	13 57 37.8	11.576
21	18 41 9.92	2.6719	20 59 41.6	5.791	21	20 44 16.88	2.4350	13 46 0.7	11.658
22	18 43 50.14	2.6687	20 53 49.4	5.948	22	20 46 42.80	2.4291	13 34 18.7	11.738
23	18 46 30.17	2.6654	S. 20° 47' 47.8"	6.103	23	20 49 8.37	2.4232	S. 13° 22' 32.1"	11.815
SUNDAY 18.					TUESDAY 20.				
0	18 49 10.00	2.6622	S. 20° 41' 37.0"	6.255	0	20 51 33.59	2.4176	S. 13° 10' 40.9"	11.899
1	18 51 49.63	2.6598	20 35 17.2	6.406	1	20 53 58.47	2.4118	12 58 45.4	11.961
2	18 54 29.05	2.6564	20 28 48.4	6.556	2	20 56 23.00	2.4059	12 46 45.5	12.034
3	18 57 8.27	2.6519	20 22 10.5	6.707	3	20 58 47.18	2.4001	12 34 41.2	12.106
4	18 59 47.27	2.6482	20 15 23.5	6.858	4	21 1 11.01	2.3944	12 22 32.7	12.176
5	19 2 26.04	2.6443	20 8 27.4	7.009	5	21 3 34.50	2.3887	12 10 20.1	12.243
6	19 5 4.57	2.6403	20 1 22.3	7.158	6	21 5 57.65	2.3829	11 58 3.5	12.308
7	19 7 42.87	2.6363	19 54 8.4	7.305	7	21 8 20.45	2.3772	11 45 43.1	12.371
8	19 10 20.92	2.6322	19 46 45.8	7.449	8	21 10 42.91	2.3714	11 33 18.9	12.433
9	19 12 58.72	2.6279	19 39 14.6	7.591	9	21 13 5.02	2.3656	11 20 51.0	12.494
10	19 15 36.27	2.6236	19 31 34.9	7.732	10	21 15 26.79	2.3600	11 8 19.6	12.552
11	19 18 13.55	2.6192	19 23 46.7	7.873	11	21 17 48.23	2.3545	10 55 44.8	12.608
12	19 20 50.57	2.6148	19 15 50.2	8.012	12	21 20 9.33	2.3490	10 43 6.7	12.661
13	19 23 27.32	2.6102	19 7 45.4	8.148	13	21 22 30.10	2.3435	10 30 25.5	12.712
14	19 26 3.79	2.6056	18 59 32.4	8.283	14	21 24 50.54	2.3379	10 17 41.3	12.762
15	19 28 39.99	2.6009	18 51 11.3	8.418	15	21 27 10.64	2.3323	10 4 54.0	12.811
16	19 31 15.90	2.5969	18 42 42.1	8.552	16	21 29 30.41	2.3268	9 52 3.8	12.859
17	19 33 51.51	2.5909	18 34 4.9	8.685	17	21 31 49.86	2.3214	9 39 10.9	12.906
18	19 36 26.81	2.5858	18 25 19.9	8.815	18	21 34 8.98	2.3159	9 26 15.3	12.948
19	19 39 1.82	2.5806	18 16 27.1	8.943	19	21 36 27.77	2.3105	9 13 17.1	12.990
20	19 41 36.52	2.5759	18 7 26.7	9.070	20	21 38 46.24	2.3053	9 0 16.4	13.030
21	19 44 10.92	2.5707	17 58 18.7	9.195	21	21 41 4.41	2.3001	8 47 13.4	13.069
22	19 46 45.01	2.5654	17 49 3.3	9.317	22	21 43 22.26	2.2949	8 34 8.1	13.106
23	19 49 18.78	2.5601	17 39 40.6	9.438	23	21 45 39.80	2.2897	8 21 0.7	13.141
24	19 51 52.23	2.5549	S. 17° 30' 10.7"	9.567	24	21 47 57.03	2.2846	S. 8° 7' 51.2"	13.174

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 21.					FRIDAY 23.				
0	21 47 57.03	2.2846	S. 8 7 51.2	13.174	0	23 32 43.27	2.1081	N. 2 34 4.1	13.084
1	21 50 13.95	2.2796	7 54 39.8	13.205	1	23 34 49.40	2.1009	2 47 6.4	13.022
2	21 52 30.57	2.2746	7 41 26.6	13.234	2	23 36 55.39	2.0987	3 0 6.7	12.989
3	21 54 46.90	2.2696	7 28 11.7	13.262	3	23 39 1.25	2.0965	3 13 5.0	12.956
4	21 57 2.92	2.2646	7 14 55.1	13.290	4	23 41 6.97	2.0943	3 26 1.2	12.919
5	21 59 18.64	2.2596	7 1 36.9	13.316	5	23 43 12.56	2.0922	3 38 55.2	12.881
6	22 1 34.07	2.2547	6 48 17.2	13.340	6	23 45 18.03	2.0902	3 51 46.9	12.843
7	22 3 49.21	2.2500	6 34 56.1	13.362	7	23 47 23.38	2.0883	4 4 36.4	12.805
8	22 6 4.07	2.2462	6 21 33.8	13.383	8	23 49 28.62	2.0863	4 17 23.5	12.765
9	22 8 18.64	2.2404	6 8 10.3	13.402	9	23 51 33.75	2.0844	4 30 8.1	12.724
10	22 10 32.93	2.2359	5 54 45.7	13.418	10	23 53 38.76	2.0826	4 42 50.3	12.682
11	22 12 46.95	2.2316	5 41 20.2	13.433	11	23 55 43.67	2.0810	4 55 30.0	12.641
12	22 15 0.71	2.2270	5 27 53.7	13.447	12	23 57 48.48	2.0794	5 8 7.2	12.597
13	22 17 14.19	2.2228	5 14 26.4	13.460	13	23 59 53.20	2.0778	5 20 41.7	12.553
14	22 19 27.41	2.2181	5 0 58.5	13.470	14	0 1 57.82	2.0762	5 33 13.5	12.509
15	22 21 40.36	2.2137	4 47 30.0	13.479	15	0 4 2.35	2.0747	5 45 42.7	12.464
16	22 23 53.05	2.2093	4 34 0.9	13.487	16	0 6 6.79	2.0732	5 58 9.1	12.419
17	22 26 5.49	2.2050	4 20 31.4	13.495	17	0 8 11.14	2.0717	6 10 32.6	12.368
18	22 28 17.67	2.2009	4 7 1.4	13.501	18	0 10 15.40	2.0702	6 22 53.1	12.319
19	22 30 29.60	2.1968	3 53 31.2	13.504	19	0 12 19.57	2.0686	6 35 10.7	12.270
20	22 32 41.29	2.1927	3 40 0.9	13.506	20	0 14 23.67	2.0678	6 47 25.4	12.220
21	22 34 52.73	2.1887	3 26 30.5	13.507	21	0 16 27.70	2.0667	6 59 37.2	12.170
22	22 37 3.93	2.1847	3 13 0.0	13.508	22	0 18 31.67	2.0657	7 11 45.8	12.118
23	22 39 14.90	2.1808	S. 2 59 29.6	13.507	23	0 20 35.58	2.0647	N. 7 23 51.2	12.064
THURSDAY 22.					SATURDAY 24.				
0	22 41 25.63	2.1770	S. 2 45 59.2	13.504	0	0 22 39.43	2.0637	N. 7 35 53.5	12.010
1	22 43 36.16	2.1731	2 32 29.1	13.498	1	0 24 43.21	2.0627	7 47 52.5	11.956
2	22 45 46.41	2.1694	2 18 59.4	13.491	2	0 26 46.94	2.0617	7 59 48.3	11.902
3	22 47 56.47	2.1658	2 5 30.2	13.484	3	0 28 50.62	2.0608	8 11 40.8	11.846
4	22 50 6.31	2.1623	1 52 1.4	13.475	4	0 30 54.24	2.0600	8 23 29.9	11.790
5	22 52 15.94	2.1587	1 38 33.1	13.465	5	0 32 57.82	2.0593	8 35 15.6	11.734
6	22 54 25.36	2.1553	1 25 5.3	13.454	6	0 35 1.36	2.0586	8 46 58.0	11.677
7	22 56 34.57	2.1520	1 11 38.4	13.442	7	0 37 4.85	2.0579	8 58 36.9	11.618
8	22 58 43.59	2.1486	0 58 12.2	13.430	8	0 39 8.30	2.0573	9 10 12.2	11.558
9	23 0 52.41	2.1453	0 44 46.7	13.417	9	0 41 11.72	2.0567	9 21 43.8	11.497
10	23 3 1.03	2.1421	0 31 22.1	13.401	10	0 43 15.10	2.0561	9 33 11.8	11.437
11	23 5 9.46	2.1389	0 17 58.6	13.383	11	0 45 18.45	2.0556	9 44 36.2	11.377
12	23 7 17.71	2.1358	S. 0 4 36.3	13.364	12	0 47 21.77	2.0551	9 55 57.0	11.315
13	23 9 25.77	2.1328	N. 0 8 44.9	13.344	13	0 49 25.07	2.0546	10 7 14.0	11.253
14	23 11 33.65	2.1298	0 22 4.9	13.323	14	0 51 28.35	2.0541	10 18 27.2	11.190
15	23 13 41.36	2.1269	0 35 23.7	13.301	15	0 53 31.61	2.0543	10 29 36.7	11.126
16	23 15 48.89	2.1241	0 48 41.2	13.279	16	0 55 34.86	2.0541	10 40 42.3	11.061
17	23 17 56.25	2.1213	1 1 57.2	13.256	17	0 57 38.10	2.0539	10 51 43.9	10.995
18	23 20 3.43	2.1185	1 15 11.7	13.230	18	0 59 41.32	2.0537	11 2 41.6	10.928
19	23 22 10.45	2.1158	1 28 24.7	13.203	19	1 1 44.53	2.0536	11 13 35.3	10.862
20	23 24 17.32	2.1132	1 41 36.0	13.176	20	1 3 47.74	2.0533	11 24 25.0	10.796
21	23 26 24.04	2.1106	1 54 45.6	13.147	21	1 5 50.94	2.0532	11 35 10.6	10.729
22	23 28 30.60	2.1080	2 7 53.6	13.117	22	1 7 54.14	2.0533	11 45 52.1	10.667
23	23 30 37.01	2.1055	2 20 59.8	13.087	23	1 9 57.35	2.0536	11 56 29.4	10.597
24	23 32 43.27	2.1031	N. 2 34 4.1	13.054	24	1 12 0.56	2.0534	N. 12 7 2.5	10.517

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 25.					TUESDAY 27.				
0	h m s	s	N.12° 7' 2.5"	10.517	0	h m s	s	N.19° 1' 18.8"	6.560
1	1 12 0.56	2.0634	12 7 31.4	10.447	1	2 51 14.83	2.0694	19 7 49.5	6.466
2	1 14 3.77	2.0636	12 27 56.2	10.377	2	2 53 20.23	2.0906	19 14 14.6	6.372
3	1 16 6.99	2.0638	12 38 16.7	10.306	3	2 55 25.69	2.0916	19 20 34.1	6.277
4	1 18 10.22	2.0640	12 48 32.9	10.234	4	2 57 31.22	2.0927	19 26 47.9	6.182
5	1 20 13.47	2.0643	12 58 44.7	10.161	5	2 59 36.82	2.0938	19 32 56.0	6.088
6	1 22 16.73	2.0645	13 8 52.1	10.087	6	3 1 42.49	2.0949	19 38 58.5	5.993
7	1 24 20.01	2.0648	13 18 55.1	10.014	7	3 3 48.22	2.0961	19 44 55.3	5.899
8	1 26 23.31	2.0651	13 28 53.7	9.940	8	3 5 54.02	2.0973	19 50 46.3	5.803
9	1 28 26.63	2.0655	13 38 47.8	9.865	9	3 7 59.89	2.0985	19 56 31.5	5.706
10	1 30 29.97	2.0659	13 48 37.4	9.790	10	3 10 5.84	2.0997	20 2 11.0	5.610
11	1 32 33.34	2.0664	13 58 22.5	9.714	11	3 12 11.86	2.1008	20 7 44.7	5.513
12	1 34 36.74	2.0669	14 8 3.0	9.636	12	3 14 17.94	2.1019	20 13 12.5	5.416
13	1 36 40.17	2.0674	14 17 38.8	9.559	13	3 16 24.07	2.1030	20 18 34.6	5.318
14	1 38 43.63	2.0679	14 27 10.0	9.482	14	3 18 30.28	2.1040	20 23 50.8	5.220
15	1 40 47.12	2.0684	14 36 36.6	9.404	15	3 20 36.55	2.1051	20 29 1.0	5.122
16	1 42 50.64	2.0690	14 45 58.5	9.325	16	3 22 42.89	2.1062	20 34 5.3	5.024
17	1 44 54.20	2.0695	14 55 15.6	9.245	17	3 24 49.29	2.1073	20 39 3.8	4.926
18	1 46 57.80	2.0700	15 4 27.9	9.164	18	3 26 55.75	2.1082	20 43 56.4	4.828
19	1 49 1.43	2.0705	15 13 35.3	9.084	19	3 29 2.27	2.1092	20 48 43.1	4.729
20	1 51 5.10	2.0710	15 22 37.9	9.004	20	3 31 8.86	2.1102	20 53 23.8	4.628
21	1 53 8.82	2.0714	15 31 35.8	8.924	21	3 33 15.51	2.1112	20 57 58.4	4.528
22	1 55 12.59	2.0718	15 40 28.8	8.843	22	3 35 22.21	2.1122	21 2 27.1	4.428
23	1 57 16.40	2.0723	N.15 49 16.9	8.761	23	3 37 28.97	2.1132	N.21 6 49.8	4.328
24	1 59 20.26	2.0727				3 39 35.79	2.1142		
MONDAY 26.					WEDNESDAY 28.				
0	h m s	s	N.15 58 0.1"	8.679	0	h m s	s	N.21 11 6.6"	4.246
1	2 1 24.16	2.0684	16 6 38.3	8.595	1	3 41 42.67	2.1102	21 15 17.2	4.138
2	2 3 28.11	2.0692	16 15 11.4	8.510	2	3 43 49.61	2.1161	21 19 21.7	4.027
3	2 5 32.11	2.0671	16 23 39.4	8.425	3	3 45 56.60	2.1170	21 23 20.2	3.925
4	2 7 36.16	2.0679	16 32 2.4	8.340	4	3 48 3.63	2.1178	21 27 12.6	3.823
5	2 9 40.26	2.0687	16 40 20.3	8.255	5	3 50 10.72	2.1187	21 30 58.9	3.721
6	2 11 44.42	2.0697	16 48 33.1	8.171	6	3 52 17.87	2.1196	21 34 39.1	3.619
7	2 13 48.63	2.0707	16 56 40.8	8.085	7	3 54 25.07	2.1205	21 38 13.1	3.517
8	2 15 52.90	2.0717	17 4 43.3	7.999	8	3 56 32.32	2.1215	21 41 41.0	3.415
9	2 17 57.23	2.0727	17 12 40.5	7.911	9	3 58 39.62	2.1221	21 45 2.9	3.313
10	2 20 1.62	2.0737	17 20 32.5	7.824	10	4 0 46.96	2.1228	21 48 18.6	3.211
11	2 22 6.06	2.0745	17 28 19.3	7.737	11	4 2 54.35	2.1236	21 51 28.1	3.108
12	2 24 10.56	2.0755	17 36 0.9	7.649	12	4 5 1.79	2.1244	21 54 31.5	3.004
13	2 26 15.13	2.0767	17 43 37.2	7.561	13	4 7 9.27	2.1250	21 57 28.6	2.900
14	2 28 19.76	2.0777	17 51 8.2	7.472	14	4 9 16.79	2.1256	22 0 19.5	2.796
15	2 30 24.45	2.0787	17 58 33.6	7.381	15	4 11 24.35	2.1262	22 3 4.1	2.692
16	2 32 29.19	2.0797	18 5 53.8	7.290	16	4 13 31.94	2.1269	22 5 42.5	2.589
17	2 34 34.00	2.0807	18 13 8.5	7.200	17	4 15 39.57	2.1275	22 8 14.7	2.485
18	2 36 38.88	2.0818	18 20 17.8	7.109	18	4 17 47.24	2.1281	22 10 40.7	2.380
19	2 38 43.82	2.0829	18 27 21.7	7.018	19	4 19 54.96	2.1287	22 13 0.4	2.276
20	2 40 48.83	2.0840	18 34 20.1	6.927	20	4 22 2.70	2.1292	22 15 13.8	2.172
21	2 42 53.90	2.0850	18 41 13.0	6.835	21	4 24 10.47	2.1298	22 17 21.0	2.067
22	2 44 59.03	2.0861	18 48 0.5	6.745	22	4 26 18.28	2.1303	22 19 21.9	1.963
23	2 47 4.23	2.0872	18 54 42.4	6.653	23	4 28 26.12	2.1308	22 21 16.5	1.859
24	2 49 9.50	2.0883	N.19 1 18.8"	6.560	24	4 30 33.98	2.1312		
	2 51 14.83	2.0894				4 32 41.87	2.1316	N.22 23 4.9	1.755

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 29.					SATURDAY 31.				
0	4 32 41.87	2.1316	N.22° 23' 4.9"	1.766	0	6 14 51.00	2.1116	N.21° 46' 11.9"	3.387
1	4 34 49.78	2.1319	22 24 47.0	1.649	1	6 16 57.66	2.1104	21 42 53.5	3.367
2	4 36 57.71	2.1322	22 26 22.8	1.544	2	6 19 4.25	2.1092	21 39 29.1	3.457
3	4 39 5.65	2.1325	22 27 52.2	1.438	3	6 21 10.77	2.1080	21 35 58.7	3.557
4	4 41 13.61	2.1327	22 29 15.3	1.333	4	6 23 17.21	2.1067	21 32 22.3	3.657
5	4 43 21.58	2.1329	22 30 32.1	1.228	5	6 25 23.57	2.1054	21 28 39.9	3.757
6	4 45 29.57	2.1332	22 31 42.6	1.123	6	6 27 29.86	2.1040	21 24 51.4	3.857
7	4 47 37.58	2.1335	22 32 46.8	1.017	7	6 29 36.07	2.1027	21 20 57.0	3.956
8	4 49 45.59	2.1336	22 33 44.6	0.911	8	6 31 42.19	2.1014	21 16 56.7	4.055
9	4 51 53.61	2.1337	22 34 36.1	0.806	9	6 33 48.23	2.1000	21 12 50.5	4.153
10	4 54 1.64	2.1338	22 35 21.3	0.701	10	6 35 54.19	2.0985	21 8 38.4	4.251
11	4 56 9.67	2.1338	22 36 0.2	0.596	11	6 38 0.06	2.0971	21 4 20.4	4.349
12	4 58 17.70	2.1338	22 36 32.7	0.490	12	6 40 5.84	2.0956	20 59 56.5	4.446
13	5 0 25.72	2.1337	22 36 58.9	0.384	13	6 42 11.53	2.0940	20 55 26.9	4.542
14	5 2 33.74	2.1337	22 37 18.8	0.278	14	6 44 17.12	2.0925	20 50 51.5	4.638
15	5 4 41.76	2.1336	22 37 32.3	0.173	15	6 46 22.62	2.0910	20 46 10.4	4.734
16	5 6 49.77	2.1336	22 37 39.5	0.067	16	6 48 28.03	2.0894	20 41 23.5	4.830
17	5 8 57.78	2.1335	22 37 40.3	0.039	17	6 50 33.34	2.0878	20 36 30.8	4.926
18	5 11 5.79	2.1334	22 37 34.8	0.145	18	6 52 38.56	2.0861	20 31 32.3	5.022
19	5 13 13.79	2.1333	22 37 22.9	0.250	19	6 54 43.68	2.0845	20 26 28.2	5.116
20	5 15 21.77	2.1330	22 37 4.7	0.355	20	6 56 48.70	2.0828	20 21 18.5	5.210
21	5 17 29.74	2.1327	22 36 40.2	0.460	21	6 58 53.61	2.0811	20 16 3.1	5.304
22	5 19 37.69	2.1324	22 36 9.4	0.566	22	7 0 58.43	2.0795	20 10 42.1	5.397
23	5 21 45.62	2.1320	N.22° 35' 32.2"	0.671	23	7 3 3.15	2.0779	N.20° 5' 15.5"	5.489
FRIDAY 30.					SUNDAY, FEBRUARY 1.				
0	5 23 53.52	2.1316	N.22° 34' 48.8"	0.779	0	7 5 7.77	2.0760	N.19° 59' 43.3"	5.582
1	5 26 1.40	2.1311	22 33 58.9	0.686	PHASES OF THE MOON.				
2	5 28 9.25	2.1305	22 33 2.7	0.590					
3	5 30 17.06	2.1300	22 32 0.2	1.003					
4	5 32 24.84	2.1295	22 30 51.5	1.197					
5	5 34 32.59	2.1290	22 29 36.6	1.301	☉ Full Moon, d h m ☾ Last Quarter, 12 15 6.8 ● New Moon, 19 4 2.1 ☽ First Quarter, 26 4 53.7				
6	5 36 40.32	2.1284	22 28 15.4	1.405					
7	5 38 48.01	2.1278	22 26 47.9	1.510					
8	5 40 55.66	2.1271	22 25 14.2	1.614					
9	5 43 3.26	2.1265	22 23 34.3	1.718	☾ Apogee, d h ☾ Perigee, 18 4.1 ☾ Apogee, 30 11.5				
10	5 45 10.83	2.1259	22 21 48.1	1.822					
11	5 47 18.36	2.1252	22 19 55.7	1.925					
12	5 49 25.84	2.1245	22 17 57.1	2.029					
13	5 51 33.27	2.1238	22 15 52.1	2.133					
14	5 53 40.64	2.1234	22 13 41.1	2.236					
15	5 55 47.95	2.1218	22 11 23.9	2.339					
16	5 57 55.21	2.1205	22 9 0.5	2.442					
17	6 0 2.41	2.1196	22 6 30.9	2.545					
18	6 2 9.55	2.1186	22 3 55.1	2.648					
19	6 4 16.63	2.1176	22 1 13.2	2.750					
20	6 6 23.64	2.1164	21 58 25.2	2.852					
21	6 8 30.58	2.1152	21 55 31.1	2.954					
22	6 10 37.46	2.1140	21 52 30.8	3.056					
23	6 12 44.27	2.1128	21 49 24.4	3.158					
24	6 14 51.00	2.1116	N.21° 46' 11.9"	3.257					

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Fomalhaut W.	89° 53' 11"	3225	91° 13' 8"	3228	92° 33' 1"	3231	93° 52' 51"	3235
	α Pegasi W.	70 26 33	3204	71 52 38	3204	73 18 43	3204	74 44 47	3204
	Mars W.	38 12 10	3252	39 37 18	3253	41 2 24	3254	42 27 29	3256
	α Arietis W.	26 48 31	3188	28 14 56	3179	29 41 30	3172	31 8 13	3166
	Pollux E.	50 10 46	3163	48 43 52	3170	47 17 8	3178	45 50 33	3186
	Regulus E.	86 38 0	3073	85 9 17	3075	83 40 37	3078	82 12 1	3081
2	Fomalhaut W.	100 30 44	3261	101 50 1	3267	103 9 11	3273	104 28 15	3280
	α Pegasi W.	81 55 4	3206	83 21 6	3206	84 47 8	3206	86 13 10	3206
	Mars W.	49 32 28	3262	50 57 24	3262	52 22 20	3262	53 47 16	3263
	α Arietis W.	38 23 33	3141	39 50 54	3138	41 18 18	3134	42 45 46	3131
	Pollux E.	38 40 22	3228	37 14 58	3262	35 49 50	3265	34 24 57	3278
	Regulus E.	74 49 43	3091	73 21 22	3091	71 53 2	3092	70 24 43	3093
	Saturn E.	112 15 40	3117	110 47 51	3118	109 20 3	3118	107 52 15	3118
3	α Pegasi W.	93 23 23	3205	94 49 26	3205	96 15 29	3206	97 41 32	3204
	Mars W.	60 51 57	3260	62 16 55	3259	63 41 54	3259	65 6 54	3257
	α Arietis W.	50 3 59	3118	51 31 47	3114	52 59 39	3112	54 27 34	3110
	Regulus E.	63 3 19	3095	61 35 3	3095	60 6 47	3095	58 38 31	3095
	Saturn E.	100 33 5	3114	99 5 12	3112	97 37 17	3111	96 9 21	3110
	Jupiter E.	120 13 12	3136	118 45 46	3134	117 18 18	3133	115 50 48	3131
4	Mars W.	72 12 22	3248	73 37 34	3247	75 2 48	3244	76 28 5	3242
	α Arietis W.	61 47 58	3096	63 16 13	3092	64 44 32	3090	66 12 55	3087
	Aldebaran W.	28 58 23	3164	30 25 15	3153	31 52 20	3140	33 19 36	3135
	Regulus E.	51 17 5	3091	49 48 45	3091	48 20 25	3091	46 52 4	3090
	Saturn E.	88 49 14	3101	87 21 6	3099	85 52 55	3097	84 24 42	3096
	Jupiter E.	108 32 44	3119	107 4 58	3117	105 37 10	3115	104 9 19	3112
5	Mars W.	83 35 17	3227	85 0 54	3224	86 26 35	3221	87 52 19	3217
	α Arietis W.	73 35 46	3069	75 4 33	3066	76 33 24	3062	78 2 20	3059
	Aldebaran W.	40 38 29	3097	42 6 42	3091	43 35 3	3085	45 3 31	3078
	Regulus E.	39 30 12	3089	38 1 48	3089	36 33 26	3090	35 5 4	3090
	Saturn E.	77 2 52	3082	75 34 21	3079	74 5 46	3078	72 37 7	3073
	Spica E.	93 16 28	3042	91 47 7	3039	90 17 42	3035	88 48 13	3032
	Jupiter E.	96 49 9	3096	95 20 55	3092	93 52 36	3089	92 24 13	3086
6	Mars W.	95 2 8	3198	96 28 20	3193	97 54 37	3188	99 21 0	3183
	α Arietis W.	85 28 11	3038	86 57 36	3033	88 27 7	3029	89 56 44	3025
	Aldebaran W.	52 27 44	3050	53 56 55	3043	55 26 14	3037	56 55 41	3030
	Saturn E.	65 13 0	3057	63 43 58	3055	62 14 53	3052	60 45 44	3048
	Spica E.	81 19 41	3013	79 49 44	3009	78 19 42	3004	76 49 34	2999
	Jupiter E.	85 1 15	3066	83 32 24	3061	82 3 27	3057	80 34 25	3053
7	Aldebaran W.	64 24 46	3001	65 54 57	2995	67 25 16	2988	68 55 44	2981
	Pollux W.	23 52 57	3258	25 16 2	3212	26 40 0	3272	28 4 44	3235
	Saturn E.	53 18 55	3030	51 49 20	3028	50 19 42	3025	48 50 0	3021
	Spica E.	69 17 23	2974	67 46 38	2969	66 15 46	2962	64 44 46	2957
	Jupiter E.	73 7 46	3027	71 38 7	3022	70 8 21	3017	68 38 29	3011
8	Aldebaran W.	76 30 9	2946	78 1 29	2939	79 32 58	2932	81 4 36	2924
	Pollux W.	35 17 40	3106	36 45 42	3087	38 14 8	3068	39 42 57	3049
	Saturn E.	41 20 33	3008	40 50 30	3007	38 20 26	3006	36 50 20	3005
	Spica E.	57 7 54	2925	55 36 7	2918	54 4 11	2911	52 32 6	2904
	Jupiter E.	61 7 19	2981	59 36 42	2973	58 5 56	2967	56 35 2	2960

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Fomalhaut W.	95° 12' 36"	3540	96° 32' 16"	3545	97° 51' 51"	3549	99° 11' 21"	3555
	α Pegasi W.	76 10 51	3204	77 36 55	3205	79 2 58	3205	80 29 1	3205
	Mars W.	43 52 32	3258	45 17 33	3259	46 42 32	3260	48 7 30	3260
	α Arietis W.	32 35 4	3158	34 2 2	3153	35 29 7	3149	36 56 17	3144
	Pollux E.	44 24 7	3197	42 57 54	3205	41 31 52	3215	40 6 1	3225
	Regulus E.	80 43 28	3083	79 14 58	3085	77 46 31	3087	76 18 6	3089
2	Fomalhaut W.	105 47 11	3589	107 5 57	3597	108 24 35	3605	109 43 4	3614
	α Pegasi W.	87 39 13	3205	89 5 15	3205	90 31 18	3205	91 57 20	3205
	Mars W.	55 12 11	3282	56 37 7	3282	58 2 3	3281	59 27 0	3281
	α Arietis W.	44 13 18	3129	45 40 53	3125	47 8 32	3128	48 36 14	3129
	Pollux E.	33 0 20	3296	31 36 4	3318	30 12 13	3341	28 48 29	3365
	Regulus E.	68 56 25	3094	67 28 8	3094	65 59 51	3095	64 31 35	3095
	Saturn E.	106 24 27	3117	104 56 38	3114	103 28 48	3115	102 0 57	3114
3	α Pegasi W.	99 7 36	3204	100 33 40	3204	101 59 44	3204	103 25 48	3204
	Mars W.	66 31 56	3255	67 57 0	3254	69 22 5	3253	70 47 12	3250
	α Arietis W.	55 55 32	3107	57 23 33	3105	58 51 38	3101	60 19 46	3099
	Regulus E.	57 10 15	3095	55 41 59	3094	54 13 42	3093	52 45 24	3092
	Saturn E.	94 41 24	3109	93 13 25	3105	91 45 23	3105	90 17 20	3103
	Jupiter E.	114 23 16	3129	112 55 42	3127	111 28 5	3125	110 0 26	3123
4	Mars W.	77 53 25	3239	79 18 48	3235	80 44 14	3234	82 9 43	3231
	α Arietis W.	67 41 21	3083	69 9 51	3080	70 38 25	3077	72 7 3	3073
	Aldebaran W.	34 47 3	3126	36 14 41	3119	37 42 28	3111	39 10 24	3104
	Regulus E.	45 23 43	3090	43 55 20	3090	42 26 58	3089	40 58 35	3089
	Saturn E.	82 56 26	3092	81 28 7	3090	79 59 45	3087	78 31 20	3085
	Jupiter E.	102 41 24	3110	101 13 26	3105	99 45 24	3104	98 17 19	3100
5	Mars W.	89 18 8	3214	90 44 1	3209	92 9 59	3205	93 36 1	3202
	α Arietis W.	79 31 20	3055	81 0 25	3051	82 29 35	3047	83 58 50	3042
	Aldebaran W.	46 32 7	3073	48 0 50	3065	49 29 41	3060	50 58 39	3055
	Regulus E.	33 36 42	3091	32 8 23	3094	30 40 6	3097	29 11 53	3101
	Saturn E.	71 8 25	3070	69 39 39	3068	68 10 50	3065	66 41 57	3061
	Spica E.	87 18 40	3028	85 49 2	3025	84 19 20	3021	82 49 33	3017
	Jupiter E.	90 55 46	3082	89 27 15	3079	87 58 40	3075	86 30 0	3071
6	Mars W.	100 47 29	3179	102 14 3	3174	103 40 43	3169	105 7 29	3163
	α Arietis W.	91 26 26	3020	92 56 14	3015	94 26 8	3010	95 56 8	3005
	Aldebaran W.	58 25 16	3026	59 54 57	3019	61 24 46	3014	62 54 42	3007
	Saturn E.	59 16 31	3044	57 47 13	3041	56 17 51	3038	54 48 25	3034
	Spica E.	75 19 20	2994	73 49 0	2989	72 18 34	2985	70 48 2	2979
	Jupiter E.	79 5 18	3045	77 36 5	3043	76 6 45	3038	74 37 19	3032
7	Aldebaran W.	70 26 20	2975	71 57 4	2968	73 27 57	2962	74 58 58	2954
	Pollux W.	29 30 12	3203	30 56 18	3175	32 22 56	3151	33 50 4	3128
	Saturn E.	47 20 13	3018	45 50 23	3015	44 20 30	3013	42 50 33	3010
	Spica E.	63 13 39	2950	61 42 24	2945	60 11 2	2939	58 39 32	2932
	Jupiter E.	67 8 30	3005	65 38 23	2999	64 8 9	2993	62 37 48	2987
8	Aldebaran W.	82 36 24	2915	84 8 22	2909	85 40 30	2900	87 12 49	2891
	Pollux W.	41 12 9	3033	42 41 41	3017	44 11 33	3001	45 41 44	2995
	Saturn E.	35 20 13	3005	33 50 7	3007	32 20 4	3009	30 50 2	3010
	Spica E.	50 59 52	2895	49 27 27	2888	47 54 53	2880	46 22 9	2872
	Jupiter E.	55 3 59	2953	53 32 47	2945	52 1 27	2939	50 29 58	2932

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
8	Antares E.	102° 36' 45"	2890	101° 5' 4"	2924	99° 33' 15"	2916	98° 1' 17"	2909
9	Aldebaran W.	88 45 19	2883	90 18 0	2874	91 50 52	2865	93 23 56	2855
	Pollux W.	47 12 14	2872	48 43 2	2858	50 14 8	2844	51 45 31	2830
	Spica E.	44 49 14	2864	43 16 9	2856	41 42 52	2847	40 9 25	2838
	Jupiter E.	48 58 20	2825	47 26 33	2917	45 54 36	2809	44 22 29	2901
	Antares E.	90 18 55	2866	88 45 53	2858	87 12 40	2849	85 39 16	2840
	SUN E.	131 28 10	3236	130 2 43	3226	128 37 5	3216	127 11 14	3206
10	Pollux W.	59 26 46	2862	60 59 53	2849	62 33 17	2836	64 6 58	2823
	Regulus W.	22 27 28	2908	23 59 37	2883	25 32 18	2859	27 5 30	2835
	Spica E.	32 19 10	2791	30 44 30	2781	29 9 37	2771	27 34 31	2761
	Jupiter E.	36 39 34	2866	35 6 32	2859	33 33 21	2852	32 0 1	2846
	Antares E.	77 49 8	2789	76 14 26	2779	74 39 30	2769	73 4 21	2757
	SUN E.	119 58 52	3149	118 31 42	3138	117 4 19	3126	115 36 41	3114
11	Pollux W.	71 59 48	2754	73 35 16	2740	75 11 3	2726	76 47 8	2711
	Regulus W.	34 58 7	2743	36 33 50	2725	38 9 56	2709	39 46 24	2692
	Antares E.	65 4 46	2699	63 28 5	2685	61 51 5	2672	60 13 47	2657
	SUN E.	108 14 39	3047	106 45 25	3034	105 15 54	3019	103 46 5	3004
12	Pollux W.	84 52 24	2639	86 30 26	2624	88 8 48	2610	89 47 30	2594
	Regulus W.	47 54 14	2610	49 32 55	2594	51 11 58	2587	52 51 23	2561
	Antares E.	52 2 52	2592	50 23 46	2578	48 44 21	2564	47 4 37	2551
	SUN .	96 12 22	2929	94 40 40	2913	93 8 38	2898	91 36 16	2881
13	Regulus W.	61 14 6	2481	62 55 46	2464	64 37 50	2448	66 20 17	2431
	Antares E.	38 41 10	2482	36 59 31	2468	35 17 33	2455	33 35 16	2441
	SUN E.	83 49 10	2799	82 14 41	2783	80 39 50	2765	79 4 36	2748
14	Regulus W.	74 58 27	2348	76 43 16	2333	78 28 28	2317	80 14 3	2300
	Spica W.	20 55 35	2350	22 40 21	2332	24 25 34	2313	26 11 14	2296
	SUN E.	71 2 51	2663	69 25 22	2647	67 47 31	2631	66 9 18	2613
15	Regulus W.	89 7 38	2226	90 55 27	2211	92 43 38	2198	94 32 8	2186
	Spica W.	35 5 46	2216	36 53 50	2201	38 42 16	2186	40 31 4	2172
	Jupiter W.	30 55 48	2296	32 41 53	2276	34 28 28	2258	36 15 29	2241
	SUN E.	57 52 38	2335	56 12 14	2320	54 31 29	2306	52 50 24	2293
	Fomalhaut E.	93 57 27	2676	92 20 15	2662	90 42 44	2648	89 4 54	2636
16	Saturn W.	66 5 46	2141	67 55 42	2131	69 45 54	2120	71 36 22	2109
	Spica W.	49 40 11	2108	51 30 58	2097	53 22 2	2085	55 13 24	2075
	Jupiter W.	45 16 55	2161	47 6 21	2148	48 56 7	2136	50 46 12	2123
	SUN E.	44 20 21	2429	42 37 27	2419	40 54 19	2409	39 10 57	2399
	Fomalhaut E.	80 51 57	2586	79 12 46	2568	77 33 28	2560	75 54 5	2577
21	Antares W.	79 2 30	2189	80 51 14	2204	82 39 35	2220	84 27 32	2238
	SUN W.	25 50 10	2537	27 30 32	2546	29 10 38	2561	30 50 26	2577
	Mars E.	66 47 35	2346	65 2 42	2362	63 18 13	2378	61 34 7	2394
	α Arietis E.	68 50 0	2213	67 1 52	2229	65 14 8	2249	63 26 49	2264
	Aldebaran E.	101 50 27	2205	100 2 7	2219	98 14 8	2235	96 26 33	2251
22	Antares W.	93 21 10	2322	95 6 37	2341	96 51 37	2359	98 36 10	2378
	SUN W.	39 4 4	2638	40 41 40	2677	42 18 51	2696	43 55 36	2716
	Mars E.	52 59 50	2485	51 18 16	2505	49 37 10	2525	47 56 31	2545

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XV ^h .	P. L. of Diff.	XVIII ^h .	P. L. of Diff.	XX ^h .	P. L. of Diff.
8	Antares E.	96° 29' 10"	2891	94° 56' 53"	2892	93° 24' 24"	2884	91° 51' 45"	2876
9	Aldebaran W.	94 57 13	2846	96 30 41	2834	98 4 22	2826	99 38 16	2818
	Pollux W.	53 17 12	2916	54 49 11	2903	56 21 26	2891	57 53 57	2876
	Spica E.	38 35 46	2828	37 1 55	2819	35 27 52	2810	33 53 37	2801
	Jupiter E.	42 50 12	2894	41 17 46	2887	39 45 11	2880	38 12 27	2873
	Antares E.	84 5 40	2830	82 31 51	2820	80 57 49	2811	79 23 35	2801
	SUN E.	125 45 12	3195	124 18 57	3184	122 52 28	3173	121 25 47	3162
10	Pollux W.	65 40 56	2890	67 15 12	2795	68 49 46	2783	70 24 38	2768
	Regulus W.	28 39 12	2816	30 13 19	2797	31 47 51	2779	33 22 47	2760
	Spica E.	25 59 12	2751	24 23 40	2743	22 47 56	2733	21 11 59	2723
	Jupiter E.	30 26 33	2843	28 53 0	2838	27 19 22	2835	25 45 39	2832
	Antares E.	71 28 57	2745	69 53 17	2734	68 17 22	2722	66 41 11	2711
	SUN E.	114 8 49	3101	112 40 41	3088	111 12 17	3074	109 43 36	3061
11	Pollux W.	78 23 33	2898	80 0 16	2883	81 37 19	2868	83 14 42	2854
	Regulus W.	41 23 14	2876	43 0 26	2860	44 38 0	2843	46 15 56	2827
	Antares E.	58 36 10	2846	56 58 17	2833	55 20 7	2820	53 41 39	2806
	SUN E.	102 15 57	2899	100 45 31	2875	99 14 47	2860	97 43 44	2845
12	Pollux W.	91 26 33	2890	93 5 56	2854	94 45 40	2849	96 25 45	2834
	Regulus W.	54 31 11	2845	56 11 21	2830	57 51 53	2813	59 32 48	2497
	Antares E.	45 24 35	2838	43 44 14	2822	42 3 32	2809	40 22 31	2494
	SUN E.	90 3 33	2865	88 30 27	2845	86 57 4	2832	85 23 18	2815
13	Regulus W.	68 3 8	2415	69 46 22	2398	71 30 0	2382	73 14 1	2364
	Antares E.	31 52 39	2429	30 9 45	2418	28 26 36	2407	26 43 11	2396
	SUN E.	77 29 0	2731	75 53 1	2714	74 16 40	2698	72 39 57	2681
14	Regulus W.	82 0 2	2385	83 46 23	2270	85 33 6	2256	87 20 11	2241
	Spica W.	27 57 20	2379	29 43 51	2262	31 30 46	2245	33 18 5	2231
	SUN E.	64 30 41	2595	62 51 41	2581	60 12 20	2566	58 32 39	2552
15	Regulus W.	96 20 56	2174	98 10 2	2161	99 59 28	2147	101 49 16	2132
	Spica W.	42 20 14	2159	44 9 43	2145	45 59 33	2132	47 49 43	2120
	Jupiter W.	38 2 56	2233	39 50 49	2206	41 39 7	2190	43 27 49	2174
	SUN E.	51 9 1	2481	49 27 21	2467	47 45 21	2452	46 3 0	2439
	Fomalhaut E.	87 26 48	2624	85 48 30	2613	84 9 53	2602	82 31 1	2588
16	Saturn W.	73 27 7	2099	75 18 7	2089	77 9 23	2079	79 0 55	2068
	Spica W.	57 5 1	2065	58 56 54	2056	60 49 1	2048	62 41 21	2040
	Jupiter W.	52 36 36	2111	54 27 18	2101	56 18 16	2092	58 9 28	2082
	SUN E.	37 27 21	2391	35 43 33	2384	33 59 35	2378	32 15 28	2372
	Fomalhaut E.	74 14 39	2677	72 35 12	2679	70 55 48	2653	69 16 29	2688
21	Antares W.	86 15 6	2253	88 2 15	2270	89 48 58	2287	91 35 16	2304
	SUN W.	32 29 53	2692	34 8 59	2699	35 47 42	2624	37 26 4	2640
	Mars E.	59 50 24	2412	58 7 7	2431	56 24 16	2448	54 41 50	2467
	α Arietis E.	61 39 57	2282	59 53 31	2300	58 7 31	2319	56 21 59	2339
	Aldebaran E.	94 39 22	2268	92 52 35	2285	91 6 13	2302	89 20 16	2320
22	Antares W.	100 20 17	2896	102 3 57	2416	103 47 9	2434	105 29 55	2469
	SUN W.	45 31 55	2734	47 7 50	2753	48 43 19	2774	50 18 21	2794
	Mars E.	46 16 20	2664	44 36 35	2684	42 57 18	2694	41 18 28	2624

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	α Arietis E.	54° 36' 56"	2356	52° 52' 21"	2378	51° 8' 15"	2400	49° 24' 40"	2421
	Aldebaran E.	87 34 45	2337	85 49 39	2356	84 5 0	2373	82 20 47	2393
23	SUN W.	51 52 57	2613	53 27 8	2634	55 0 52	2654	56 34 10	2673
	Fomalhaut W.	34 27 14	4395	35 32 40	4259	36 40 11	4138	37 49 36	4033
	Mars E.	39 40 6	2644	38 2 11	2666	36 24 44	2686	34 47 45	2707
	α Arietis E.	40 54 26	2534	39 14 0	2569	37 34 8	2584	35 54 51	2610
	Aldebaran E.	73 46 31	2488	72 5 1	2508	70 23 59	2528	68 43 25	2548
24	SUN W.	64 14 17	2973	65 45 3	2993	67 15 25	3013	68 45 22	3031
	Fomalhaut W.	43 58 4	3697	45 14 54	3656	46 32 28	3620	47 50 41	3589
	α Pegasi W.	21 52 35	3783	23 7 55	3656	24 25 30	3560	25 44 59	3466
	Aldebaran E.	60 27 18	2645	58 49 24	2664	57 11 56	2684	55 34 55	2704
	Pollux E.	102 25 30	2678	100 48 20	2696	99 11 34	2713	97 35 11	2730
25	SUN W.	76 9 20	3124	77 37 0	3142	79 4 19	3160	80 31 17	3174
	Fomalhaut W.	54 28 50	3489	55 49 26	3480	57 10 13	3470	58 31 11	3461
	α Pegasi W.	32 40 31	3230	34 5 54	3217	35 31 43	3201	36 57 51	3188
	Aldebaran E.	47 36 10	2796	48 1 39	2817	46 27 33	2836	42 53 51	2864
	Pollux E.	89 38 57	2816	88 4 48	2831	86 31 0	2847	84 57 33	2863
26	SUN W.	87 41 20	3256	89 6 24	3269	90 31 12	3282	91 55 44	3294
	Fomalhaut W.	65 17 34	3446	66 38 59	3446	68 0 23	3447	69 21 46	3448
	α Pegasi W.	44 11 37	3154	45 38 41	3153	47 5 46	3153	48 32 51	3153
	Aldebaran E.	35 11 21	2949	33 40 4	2969	32 9 12	2969	30 38 45	3009
	Pollux E.	77 15 15	2637	75 43 43	2662	74 12 30	2666	72 41 35	2680
27	SUN W.	98 54 40	3356	100 17 47	3368	101 40 40	3379	103 3 21	3389
	Fomalhaut W.	76 8 9	3463	77 29 15	3466	78 50 17	3471	80 11 14	3476
	α Pegasi W.	55 47 55	3165	57 14 46	3168	58 41 34	3171	60 8 18	3173
	Pollux E.	65 11 4	3043	63 41 44	3054	62 12 38	3066	60 43 47	3076
	Regulus E.	101 51 58	2965	100 21 26	2996	98 51 7	3004	97 20 59	3013
28	SUN W.	109 54 8	3431	111 15 50	3438	112 37 24	3444	113 58 51	3460
	Fomalhaut W.	86 54 40	3499	88 15 5	3506	89 35 24	3511	90 55 36	3516
	α Pegasi W.	67 21 0	3190	68 47 21	3193	70 13 38	3196	71 39 52	3199
	α Arietis W.	23 43 26	3209	25 9 25	3198	26 35 36	3188	28 1 59	3180
	Mars W.	21 1 45	3265	22 26 49	3260	23 51 47	3265	25 16 40	3268
	Pollux E.	53 22 53	3131	51 55 21	3141	50 28 1	3152	49 0 54	3162
	Regulus E.	89 52 51	3049	88 23 39	3056	86 54 36	3062	85 25 40	3067
29	α Pegasi W.	78 50 17	3209	80 16 15	3211	81 42 11	3212	83 8 6	3214
	α Arietis W.	35 15 54	3155	36 42 57	3162	38 10 4	3149	39 37 14	3147
	Mars W.	32 20 5	3263	33 44 36	3266	35 9 4	3266	36 33 30	3269
	Pollux E.	41 48 25	3216	40 22 34	3226	38 56 58	3241	37 31 37	3253
	Regulus E.	78 2 27	3087	76 34 2	3091	75 5 41	3084	73 37 24	3096
30	α Pegasi W.	90 17 24	3216	91 43 14	3215	93 9 5	3216	94 34 56	3216
	α Arietis W.	46 53 50	3133	48 21 19	3131	49 48 51	3129	51 16 26	3126
	Mars W.	43 35 20	3293	44 59 41	3291	46 24 3	3290	47 48 26	3290
	Regulus E.	66 16 28	3101	64 48 20	3102	63 20 13	3102	61 52 6	3101
31	α Arietis W.	58 35 20	3116	60 3 20	3106	61 31 24	3101	62 59 33	3096
	Mars W.	54 50 46	3279	56 15 22	3276	57 40 2	3272	59 4 46	3270
	Regulus E.	54 31 19	3097	53 3 6	3095	51 34 50	3093	50 6 32	3091

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
22	α Arietis E.	47° 41' 35"	2443	45° 59' 0"	2466	44° 16' 57"	2487	42° 35' 25"	2510
	Aldebaran E.	80 37 2	2411	78 53 43	2430	77 10 51	2450	75 28 27	2470
23	Sun W.	58 7 3	2694	59 39 30	2914	61 11 31	2934	62 43 7	2964
	Fomalhaut W.	39 0 43	2644	40 13 18	2870	41 27 8	2805	42 42 5	2746
	Mars E.	33 11 15	2730	31 35 15	2754	29 59 47	2778	28 24 50	2802
	α Arietis W.	34 16 9	2638	32 38 5	2666	31 0 40	2695	29 23 54	2737
	Aldebaran E.	67 3 18	2567	65 23 38	2587	63 44 25	2506	62 5 38	2626
24	Sun W.	70 14 56	3061	71 44 6	3069	73 12 53	3087	74 41 18	3106
	Fomalhaut W.	49 9 28	3061	50 28 45	3039	51 48 26	3020	53 8 28	3002
	α Pegasi W.	27 6 1	3400	28 28 18	3347	29 51 35	3304	31 15 42	3268
	Aldebaran E.	53 58 20	2722	52 22 10	2741	50 46 25	2760	49 11 5	2779
	Pollux E.	95 59 11	2747	94 23 33	2765	92 48 19	2782	91 13 27	2798
25	Sun W.	81 57 57	3191	83 24 17	3208	84 50 17	3224	86 15 58	3240
	Fomalhaut W.	59 52 19	3456	61 13 32	3453	62 34 49	3449	63 56 10	3446
	α Pegasi W.	38 24 15	3176	39 50 53	3167	41 17 42	3162	42 44 37	3166
	Aldebaran E.	41 20 33	2873	39 47 39	2891	38 15 9	2910	36 43 3	2929
	Pollux E.	83 24 26	2878	81 51 39	2894	80 19 12	2909	78 47 4	2924
26	Sun W.	93 20 2	3309	94 44 3	3322	96 7 49	3334	97 31 21	3346
	Fomalhaut W.	70 43 8	3450	72 4 28	3453	73 25 45	3455	74 46 59	3459
	α Pegasi W.	49 59 57	3163	51 27 2	3157	52 54 3	3159	54 21 1	3163
	Aldebaran E.	29 8 44	3033	27 39 11	3056	26 10 7	3081	24 41 34	3106
	Pollux E.	71 10 57	2993	69 40 35	3008	68 10 29	3018	66 40 39	3030
27	Sun W.	104 25 50	3390	105 48 8	3407	107 10 17	3415	108 32 17	3423
	Fomalhaut W.	81 32 6	3480	82 52 53	3484	84 13 35	3490	85 34 10	3496
	α Pegasi W.	61 34 59	3178	63 1 35	3181	64 28 7	3184	65 54 35	3187
	Pollux E.	59 15 10	3098	57 46 46	3099	56 18 35	3110	54 50 38	3120
	Regulus E.	95 51 2	3021	94 21 15	3029	92 51 38	3036	91 22 10	3043
28	Sun W.	115 20 11	3456	116 41 24	3461	118 2 32	3466	119 23 34	3470
	Fomalhaut W.	92 15 42	3523	93 35 41	3528	94 55 34	3534	96 15 21	3540
	α Pegasi W.	73 6 2	3301	74 32 10	3304	75 58 15	3306	77 24 17	3308
	α Arietis W.	29 28 32	3173	30 55 14	3168	32 22 2	3163	33 48 56	3169
	Mars W.	26 41 29	3271	28 6 14	3276	29 30 55	3278	30 55 32	3283
	Pollux E.	47 33 59	3172	46 7 16	3183	44 40 46	3193	43 14 29	3204
	Regulus E.	83 56 50	3071	82 28 5	3077	80 59 27	3082	79 30 55	3086
29	α Pegasi W.	84 33 59	3214	85 59 51	3215	87 25 42	3216	88 51 33	3216
	α Arietis W.	41 4 27	3143	42 31 44	3142	43 59 3	3139	45 26 25	3137
	Mars W.	37 57 54	3290	39 22 17	3292	40 46 38	3292	42 10 59	3292
	Pollux E.	36 6 31	3260	34 41 43	3265	33 17 14	3262	31 53 5	3252
	Regulus E.	72 9 9	3097	70 40 56	3099	69 12 45	3101	67 44 36	3101
30	α Pegasi W.	96 0 57	3215	97 26 38	3214	98 52 30	3214	99 18 23	3212
	α Arietis W.	52 44 5	3122	54 11 48	3119	55 39 35	3115	57 7 26	3113
	Mars W.	49 12 49	3288	50 37 14	3286	52 1 42	3284	53 26 12	3281
	Regulus E.	60 23 58	3101	58 55 50	3101	57 27 41	3100	55 59 31	3098
31	α Arietis W.	64 27 47	3092	65 56 6	3087	67 24 31	3082	68 53 2	3077
	Mars W.	60 29 33	3265	61 54 25	3262	63 19 21	3257	64 44 23	3253
	Regulus E.	48 38 12	3090	47 9 50	3087	45 41 25	3086	44 12 58	3083

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semidiameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
<i>Sun.</i>	1	^h 20 ^m 58 ^s 40.70	10.188	S. 17° 6' 57.3	42.55	16 15.99	68.30	13 50.86	0.331
<i>Mon.</i>	2	21 2 44.82	10.154	16 51 46.9	43.30	16 15.84	68.18	13 58.40	0.297
<i>Tues.</i>	3	21 6 48.11	10.120	16 34 19.0	44.03	16 15.69	68.06	14 5.12	0.263
<i>Wed.</i>	4	21 10 50.59	10.086	16 16 33.8	44.74	16 15.54	67.94	14 11.03	0.229
<i>Thur.</i>	5	21 14 52.25	10.052	15 58 31.6	45.43	16 15.38	67.82	14 16.12	0.195
<i>Fri.</i>	6	21 18 53.10	10.019	15 40 12.9	46.11	16 15.21	67.70	14 20.40	0.162
<i>Sat.</i>	7	21 22 53.14	9.986	15 21 38.1	46.77	16 15.04	67.59	14 23.88	0.129
<i>Sun.</i>	8	21 26 52.39	9.953	15 2 47.5	47.42	16 14.86	67.48	14 26.58	0.096
<i>Mon.</i>	9	21 30 50.87	9.921	14 43 41.6	48.05	16 14.67	67.37	14 28.50	0.064
<i>Tues.</i>	10	21 34 48.58	9.889	14 24 20.9	48.66	16 14.48	67.26	14 29.65	0.032
<i>Wed.</i>	11	21 38 45.53	9.857	14 4 45.7	49.25	16 14.29	67.15	14 30.04	0.001
<i>Thur.</i>	12	21 42 41.71	9.826	13 44 56.6	49.83	16 14.10	67.04	14 29.67	0.031
<i>Fri.</i>	13	21 46 37.14	9.795	13 24 53.9	50.39	16 13.90	66.93	14 28.55	0.062
<i>Sat.</i>	14	21 50 31.83	9.765	13 4 38.0	50.93	16 13.70	66.82	14 26.70	0.092
<i>Sun.</i>	15	21 54 25.80	9.735	12 44 9.3	51.45	16 13.50	66.71	14 24.12	0.122
<i>Mon.</i>	16	21 58 19.05	9.705	12 23 28.2	51.95	16 13.29	66.61	14 20.83	0.152
<i>Tues.</i>	17	22 2 11.59	9.675	12 2 35.3	52.43	16 13.08	66.51	14 16.82	0.181
<i>Wed.</i>	18	22 6 3.42	9.646	11 41 31.1	52.90	16 12.87	66.41	14 12.11	0.210
<i>Thur.</i>	19	22 9 54.56	9.617	11 20 15.9	53.35	16 12.66	66.31	14 6.71	0.238
<i>Fri.</i>	20	22 13 45.02	9.589	10 58 50.1	53.79	16 12.44	66.21	14 0.63	0.267
<i>Sat.</i>	21	22 17 34.82	9.562	10 37 14.0	54.20	16 12.22	66.12	13 53.89	0.294
<i>Sun.</i>	22	22 21 23.95	9.535	10 15 28.2	54.60	16 12.00	66.03	13 46.49	0.321
<i>Mon.</i>	23	22 25 12.43	9.509	9 53 33.1	54.98	16 11.78	65.94	13 38.44	0.347
<i>Tues.</i>	24	22 29 0.27	9.483	9 31 29.3	55.34	16 11.55	65.85	13 29.75	0.374
<i>Wed.</i>	25	22 32 47.50	9.458	9 9 17.1	55.68	16 11.32	65.76	13 20.46	0.399
<i>Thur.</i>	26	22 36 34.13	9.433	8 46 56.8	56.01	16 11.09	65.68	13 10.56	0.424
<i>Fri.</i>	27	22 40 20.17	9.409	8 24 28.7	56.32	16 10.86	65.60	13 0.07	0.448
<i>Sat.</i>	28	22 44 5.63	9.385	8 1 53.3	56.62	16 10.62	65.52	12 49.01	0.472
<i>Sun.</i>	29	22 47 50.55	9.363	S. 7 39 11.0	56.90	16 10.38	65.44	12 37.41	0.494

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		^h ^m ^s	^s	[°] ['] ["]	["]	^m ^s	^s	^h ^m ^s
Sun.	1	20 58 38.34	10.188	S. 17 9 7.2	42.55	13 50.79	0.331	20 44 47.55
Mon.	2	21 2 42.45	10.154	16 51 57.1	43.30	13 58.34	0.297	20 48 44.11
Tues.	3	21 6 45.73	10.120	16 34 29.4	44.03	14 5.07	0.263	20 52 40.66
Wed.	4	21 10 48.20	10.086	16 16 44.4	44.74	14 10.98	0.229	20 56 37.22
Thur.	5	21 14 49.85	10.052	15 58 42.4	45.43	14 16.08	0.195	21 0 33.77
Fri.	6	21 18 50.70	10.019	15 40 23.9	46.11	14 20.37	0.162	21 4 30.33
Sat.	7	21 22 50.74	9.986	15 21 49.3	46.77	14 23.86	0.129	21 8 26.88
Sun.	8	21 26 49.99	9.953	15 2 58.9	47.42	14 26.55	0.096	21 12 23.44
Mon.	9	21 30 48.47	9.921	14 43 53.2	48.05	14 28.48	0.064	21 16 19.99
Tues.	10	21 34 46.19	9.889	14 24 32.7	48.66	14 29.64	0.032	21 20 16.55
Wed.	11	21 38 43.15	9.857	14 4 57.7	49.25	14 30.05	0.001	21 24 13.10
Thur.	12	21 42 39.34	9.826	13 45 8.7	49.83	14 29.68	0.031	21 28 9.66
Fri.	13	21 46 34.78	9.795	13 25 6.1	50.39	14 28.57	0.062	21 32 6.21
Sat.	14	21 50 29.48	9.765	13 4 50.3	50.93	14 26.72	0.092	21 36 2.76
Sun.	15	21 54 23.46	9.735	12 44 21.7	51.45	14 24.14	0.122	21 39 59.32
Mon.	16	21 58 16.73	9.705	12 23 40.7	51.95	14 20.86	0.152	21 43 55.87
Tues.	17	22 2 9.29	9.675	12 2 47.9	52.43	14 16.86	0.181	21 47 52.43
Wed.	18	22 6 1.14	9.646	11 41 43.7	52.90	14 12.16	0.210	21 51 48.98
Thur.	19	22 9 52.30	9.617	11 20 28.5	53.35	14 6.77	0.238	21 55 45.53
Fri.	20	22 13 42.78	9.589	10 59 2.7	53.79	14 0.69	0.267	21 59 42.09
Sat.	21	22 17 32.60	9.562	10 37 26.6	54.20	13 53.96	0.294	22 3 38.64
Sun.	22	22 21 21.76	9.535	10 15 40.8	54.60	13 46.56	0.321	22 7 35.20
Mon.	23	22 25 10.26	9.509	9 53 45.7	54.98	13 38.51	0.347	22 11 31.75
Tues.	24	22 28 58.13	9.483	9 31 41.8	55.34	13 29.83	0.374	22 15 28.30
Wed.	25	22 32 45.39	9.458	9 9 29.5	55.68	13 20.54	0.399	22 19 24.85
Thur.	26	22 36 32.05	9.433	8 47 9.1	56.01	13 10.64	0.424	22 23 21.41
Fri.	27	22 40 18.12	9.409	8 24 40.9	56.32	13 0.16	0.448	22 27 17.96
Sat.	28	22 44 3.62	9.385	8 2 5.4	56.62	12 49.11	0.472	22 31 14.51
Sun.	29	22 47 48.58	9.363	S. 7 39 23.0	56.90	12 37.51	0.494	22 35 11.07

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	32	312° 11' 56.4	11' 34.0	152.11	—0.52	9.9937190	27.2	3 ^h 14 ^m 40.47 ^s	
2	33	313 12 46.3	12 23.8	152.06	0.62	.9937855	28.2	3 10 44.56	
3	34	314 13 35.0	13 12.4	152.01	0.70	.9938544	29.2	3 6 48.65	
4	35	315 14 22.5	13 59.8	151.95	0.76	.9939258	30.2	3 2 52.74	
5	36	316 15 8.8	14 45.9	151.91	0.80	.9939996	31.2	2 58 56.83	
6	37	317 15 53.9	15 30.9	151.86	0.79	.9940757	32.1	2 55 0.92	
7	38	318 16 37.9	16 14.8	151.82	0.76	.9941541	33.1	2 51 5.01	
8	39	319 17 20.8	16 57.6	151.77	0.70	.9942347	34.0	2 47 9.10	
9	40	320 18 2.7	17 39.4	151.73	0.61	.9943174	34.8	2 43 13.20	
10	41	321 18 43.6	18 40.1	151.68	0.51	.9944019	35.6	2 39 17.29	
11	42	322 19 23.4	18 59.8	151.64	0.39	.9944882	36.3	2 35 21.38	
12	43	323 20 2.0	19 38.3	151.59	0.26	.9945761	36.9	2 31 25.47	
13	44	324 20 39.5	20 15.7	151.54	0.13	.9946654	37.5	2 27 29.56	
14	45	325 21 15.9	20 52.0	151.48	—0.00	.9947559	38.0	2 23 33.66	
15	46	326 21 50.9	21 26.8	151.42	+0.11	.9948475	38.4	2 19 37.75	
16	47	327 22 24.5	22 0.3	151.36	0.21	.9949403	38.8	2 15 41.84	
17	48	328 22 56.6	22 32.3	151.30	0.27	.9950341	39.2	2 11 45.93	
18	49	329 23 27.2	23 2.8	151.24	0.31	.9951288	39.5	2 7 50.02	
19	50	330 23 56.2	23 31.7	151.18	0.32	.9952243	39.9	2 3 54.12	
20	51	331 24 23.6	23 58.9	151.11	0.28	.9953205	40.2	1 59 58.21	
21	52	332 24 49.2	24 24.4	151.03	0.24	.9954175	40.6	1 56 2.30	
22	53	333 25 13.0	24 48.1	150.95	0.16	.9955154	40.9	1 52 6.39	
23	54	334 25 34.9	25 9.9	150.87	+0.07	.9956143	41.3	1 48 10.48	
24	55	335 25 54.8	25 29.7	150.79	—0.05	.9957142	41.8	1 44 14.58	
25	56	336 26 12.6	25 47.4	150.71	0.17	.9958152	42.3	1 40 18.67	
26	57	337 26 28.4	26 3.1	150.62	0.30	.9959174	42.8	1 36 22.76	
27	58	338 26 42.3	26 16.9	150.54	0.43	.9960209	43.3	1 32 26.85	
28	59	339 26 54.2	26 28.7	150.45	0.57	.9961257	43.9	1 28 30.94	
29	60	340 27 4.0	26 38.4	150.37	—0.67	9.9962320	44.5	1 24 35.04	

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	14 47.7	14 49.3	54 11.2	+0.43	54 17.1	+0.55	10 40.7	1.95	12.8
2	14 51.3	14 53.6	54 24.3	0.65	54 32.7	0.74	11 26.9	1.90	13.8
3	14 56.2	14 59.0	54 42.1	0.83	54 52.5	0.90	12 12.0	1.86	14.8
4	15 2.0	15 5.2	55 3.7	0.96	55 15.6	1.02	12 56.3	1.84	15.8
5	15 8.6	15 12.2	55 28.1	1.07	55 41.3	1.12	13 40.3	1.84	16.8
6	15 16.0	15 20.0	55 55.2	1.17	56 9.6	1.22	14 24.7	1.87	17.8
7	15 24.0	15 28.2	56 24.5	1.27	56 40.0	1.31	15 10.3	1.94	18.8
8	15 32.6	15 37.1	56 55.9	1.36	57 12.5	1.40	15 57.8	2.04	19.8
9	15 41.8	15 46.4	57 29.5	1.46	57 46.9	1.48	16 48.1	2.17	20.8
10	15 51.3	15 56.1	58 4.6	1.49	58 22.5	1.49	17 42.0	2.31	21.8
11	16 1.0	16 5.8	58 40.4	1.48	58 58.0	1.44	18 39.1	2.42	22.8
12	16 10.4	16 14.8	59 14.9	1.37	59 30.9	1.27	19 39.0	2.48	23.8
13	16 18.7	16 22.3	59 45.6	1.15	59 58.4	0.97	20 40.0	2.52	24.8
14	16 25.1	16 27.2	60 8.9	0.76	60 16.7	+0.52	21 40.3	2.47	25.8
15	16 28.5	16 28.9	60 21.4	+0.25	60 22.6	-0.03	22 38.7	2.37	26.8
16	16 28.3	16 26.7	60 20.5	-0.33	60 14.7	0.64	23 34.2	2.25	27.8
17	16 24.1	16 20.6	60 5.2	0.95	59 52.0	1.24	δ		28.8
18	16 16.1	16 10.8	59 35.7	1.50	59 16.5	1.70	0 26.9	2.15	0.4
19	16 5.0	15 58.6	58 55.0	1.90	58 31.6	2.01	1 17.4	2.07	1.4
20	15 51.9	15 44.9	58 6.9	2.10	57 41.3	2.13	2 6.5	2.03	2.4
21	15 37.9	15 31.0	57 15.6	2.10	56 50.3	2.07	2 54.9	2.01	3.4
22	15 23.3	15 18.0	56 25.8	1.99	56 2.6	1.87	3 43.1	2.01	4.4
23	15 12.1	15 6.8	55 40.9	1.72	55 21.2	1.54	4 31.6	2.03	5.4
24	15 2.0	14 57.9	55 3.7	1.36	54 48.5	1.16	5 20.5	2.04	6.4
25	14 54.4	14 51.6	54 35.8	0.95	54 25.6	0.74	6 9.6	2.04	7.4
26	14 49.6	14 48.2	54 18.0	0.52	54 13.1	-0.30	6 58.6	2.03	8.4
27	14 47.6	14 47.6	54 10.7	-0.10	54 10.7	+0.10	7 47.2	2.00	9.4
28	14 48.3	14 49.5	54 13.2	+0.29	54 17.8	0.48	8 34.9	1.97	10.4
29	14 51.4	14 53.7	54 24.6	+0.64	54 33.3	+0.79	9 21.5	1.92	11.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 1.					TUESDAY 3.				
0	7 5 7.77	2.0700	N.19 59 43.3	5.582	0	8 42 38.50	1.9878	N.13 55 3.7	9.392
1	7 7 12.28	2.0744	19 54 5.6	5.574	1	8 44 37.72	1.9861	13 45 38.2	9.487
2	7 9 16.69	2.0737	19 48 22.5	5.764	2	8 46 36.84	1.9844	13 36 8.8	9.531
3	7 11 21.00	2.0708	19 42 33.8	5.565	3	8 48 35.85	1.9828	13 26 35.6	9.585
4	7 13 25.19	2.0689	19 36 39.8	5.545	4	8 50 34.77	1.9812	13 16 58.6	9.647
5	7 15 29.27	2.0670	19 30 40.3	5.587	5	8 52 33.60	1.9796	13 7 17.9	9.708
6	7 17 33.24	2.0652	19 24 35.3	5.127	6	8 54 32.33	1.9780	12 57 33.6	9.769
7	7 19 37.09	2.0632	19 18 25.0	5.216	7	8 56 30.97	1.9765	12 47 45.6	9.830
8	7 21 40.82	2.0612	19 12 9.4	5.304	8	8 58 29.52	1.9751	12 37 54.0	9.890
9	7 23 44.44	2.0593	19 5 48.6	5.392	9	9 0 27.99	1.9737	12 27 58.9	9.948
10	7 25 47.94	2.0575	18 59 22.5	5.479	10	9 2 26.37	1.9723	12 18 0.3	10.006
11	7 27 51.33	2.0556	18 52 51.1	5.567	11	9 4 24.66	1.9708	12 7 58.2	10.064
12	7 29 54.60	2.0537	18 46 14.5	5.553	12	9 6 22.87	1.9695	11 57 52.7	10.120
13	7 31 57.78	2.0519	18 39 32.7	5.789	13	9 8 21.00	1.9682	11 47 43.8	10.176
14	7 34 0.87	2.0504	18 32 45.8	5.925	14	9 10 19.05	1.9668	11 37 31.5	10.232
15	7 36 3.85	2.0486	18 25 53.9	5.909	15	9 12 17.01	1.9654	11 27 15.7	10.288
16	7 38 6.70	2.0466	18 18 56.8	5.994	16	9 14 14.90	1.9641	11 16 56.6	10.343
17	7 40 9.44	2.0447	18 11 54.6	7.079	17	9 16 12.80	1.9629	11 6 34.4	10.397
18	7 42 12.06	2.0428	18 4 47.3	7.162	18	9 18 10.44	1.9617	10 56 9.1	10.449
19	7 44 14.58	2.0410	17 57 35.1	7.244	19	9 20 8.11	1.9606	10 45 40.7	10.499
20	7 46 16.98	2.0390	17 50 18.0	7.327	20	9 22 5.71	1.9594	10 35 9.2	10.550
21	7 48 19.26	2.0371	17 42 55.9	7.410	21	9 24 3.23	1.9581	10 24 34.5	10.601
22	7 50 21.43	2.0352	17 35 28.8	7.492	22	9 26 0.68	1.9571	10 13 56.8	10.651
23	7 52 23.48	2.0332	N.17 27 56.8	7.573	23	9 27 58.07	1.9561	N.10 3 16.2	10.701
MONDAY 2.					WEDNESDAY 4.				
0	7 54 25.42	2.0310	N.17 20 20.0	7.553	0	9 29 55.41	1.9552	N. 9 52 32.7	10.760
1	7 56 27.24	2.0293	17 12 38.6	7.731	1	9 31 52.69	1.9543	9 41 46.3	10.797
2	7 58 28.95	2.0277	17 4 52.4	7.899	2	9 33 49.91	1.9532	9 30 57.1	10.843
3	8 0 30.55	2.0266	16 57 1.3	7.997	3	9 35 47.06	1.9523	9 20 5.2	10.889
4	8 2 32.03	2.0237	16 49 5.7	7.965	4	9 37 44.16	1.9512	9 9 10.5	10.935
5	8 4 33.40	2.0218	16 41 5.4	8.044	5	9 39 41.21	1.9503	8 58 13.1	10.979
6	8 6 34.65	2.0200	16 33 0.4	8.121	6	9 41 38.20	1.9494	8 47 13.0	11.023
7	8 8 35.79	2.0180	16 24 50.8	8.198	7	9 43 35.14	1.9487	8 36 10.3	11.066
8	8 10 36.82	2.0162	16 16 36.7	8.273	8	9 45 32.04	1.9480	8 25 5.1	11.108
9	8 12 37.74	2.0142	16 8 18.1	8.347	9	9 47 28.90	1.9472	8 13 57.3	11.150
10	8 14 38.54	2.0125	15 59 55.0	8.423	10	9 49 25.71	1.9466	8 2 46.9	11.192
11	8 16 39.24	2.0108	15 51 27.5	8.496	11	9 51 22.48	1.9460	7 51 34.1	11.233
12	8 18 39.80	2.0091	15 42 55.5	8.569	12	9 53 19.22	1.9453	7 40 19.0	11.271
13	8 20 40.29	2.0072	15 34 19.2	8.640	13	9 55 15.92	1.9447	7 29 1.6	11.309
14	8 22 40.67	2.0053	15 25 38.6	8.711	14	9 57 12.58	1.9443	7 17 41.9	11.346
15	8 24 40.93	2.0035	15 16 53.8	8.782	15	9 59 9.21	1.9437	7 6 20.0	11.383
16	8 26 41.09	2.0017	15 8 4.7	8.853	16	10 1 5.82	1.9433	6 54 55.9	11.420
17	8 28 41.14	1.9998	14 59 11.4	8.923	17	10 3 2.40	1.9429	6 43 29.6	11.456
18	8 30 41.07	1.9980	14 50 13.9	8.993	18	10 4 58.96	1.9425	6 32 1.2	11.490
19	8 32 40.89	1.9963	14 41 12.3	9.063	19	10 6 55.50	1.9422	6 20 30.8	11.524
20	8 34 40.61	1.9945	14 32 6.6	9.131	20	10 8 52.02	1.9418	6 8 58.4	11.558
21	8 36 40.24	1.9928	14 22 56.8	9.197	21	10 10 48.53	1.9416	5 57 23.9	11.591
22	8 38 39.76	1.9911	14 13 43.0	9.263	22	10 12 45.02	1.9414	5 45 47.5	11.623
23	8 40 39.18	1.9895	14 4 25.3	9.327	23	10 14 41.50	1.9413	5 34 9.2	11.653
24	8 42 38.50	1.9878	N.13 55 3.7	9.392	24	10 16 37.98	1.9413	N. 5 22 29.1	11.682

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 5.					SATURDAY 7.				
0	^h 10 ^m 16 ^s 37.98	1.9413	N. 5° 22' 29.1"	11.082	0	^h 11 ^m 50 ^s 36.97	1.9846	S. 4° 17' 9.9"	12.140
1	10 18 34.46	1.9413	5 10 47.4	11.710	1	11 52 36.72	1.9970	4 29 18.0	12.128
2	10 20 30.94	1.9413	4 59 3.9	11.738	2	11 54 36.62	1.9995	4 41 25.2	12.116
3	10 22 27.42	1.9413	4 47 18.6	11.767	3	11 56 36.68	2.0021	4 53 31.6	12.101
4	10 24 23.89	1.9413	4 35 31.8	11.794	4	11 58 36.88	2.0047	5 5 37.2	12.086
5	10 26 20.37	1.9414	4 23 43.4	11.821	5	12 0 37.24	2.0073	5 17 41.9	12.070
6	10 28 16.86	1.9416	4 11 53.3	11.847	6	12 2 37.75	2.0100	5 29 45.6	12.052
7	10 30 13.36	1.9418	4 0 1.9	11.871	7	12 4 38.42	2.0127	5 41 48.2	12.034
8	10 32 9.88	1.9421	3 48 9.1	11.894	8	12 6 39.26	2.0155	5 53 49.7	12.016
9	10 34 6.42	1.9425	3 36 14.8	11.916	9	12 8 40.28	2.0185	6 5 50.1	11.998
10	10 36 2.98	1.9429	3 24 19.1	11.939	10	12 10 41.47	2.0214	6 17 49.3	11.978
11	10 37 59.56	1.9432	3 12 22.1	11.961	11	12 12 42.84	2.0243	6 29 47.3	11.957
12	10 39 56.15	1.9435	3 0 23.7	11.982	12	12 14 44.39	2.0273	6 41 44.0	11.934
13	10 41 52.77	1.9440	2 48 24.1	12.001	13	12 16 46.12	2.0303	6 53 39.3	11.908
14	10 43 49.43	1.9445	2 36 23.5	12.019	14	12 18 48.04	2.0335	7 5 33.0	11.881
15	10 45 46.14	1.9453	2 24 22.0	12.035	15	12 20 50.15	2.0367	7 17 25.0	11.855
16	10 47 42.88	1.9460	2 12 19.5	12.051	16	12 22 52.44	2.0400	7 29 15.7	11.830
17	10 49 39.66	1.9467	2 0 16.0	12.067	17	12 24 54.93	2.0433	7 41 4.7	11.803
18	10 51 36.47	1.9474	1 48 11.4	12.084	18	12 26 57.63	2.0466	7 52 52.0	11.775
19	10 53 33.33	1.9481	1 36 5.8	12.098	19	12 29 0.53	2.0500	8 4 37.6	11.746
20	10 55 30.24	1.9490	1 23 59.4	12.111	20	12 31 3.63	2.0534	8 16 21.3	11.714
21	10 57 27.21	1.9500	1 11 52.3	12.124	21	12 33 6.94	2.0568	8 28 3.2	11.683
22	10 59 24.24	1.9510	0 59 44.5	12.136	22	12 35 10.46	2.0605	8 39 43.2	11.650
23	11 1 21.33	1.9520	N. 0° 47' 36.0"	12.148	23	12 37 14.19	2.0641	S. 8° 51' 21.1"	11.616
FRIDAY 6.					SUNDAY 8.				
0	11 3 18.47	1.9530	N. 0° 35' 26.7"	12.160	0	12 39 18.14	2.0677	S. 9° 2' 57.0"	11.580
1	11 5 15.68	1.9540	0 23 16.8	12.170	1	12 41 22.32	2.0715	9 14 30.7	11.543
2	11 7 12.96	1.9551	N. 0° 11' 6.4"	12.178	2	12 43 26.73	2.0753	9 26 2.2	11.507
3	11 9 10.30	1.9563	S. 0° 1' 4.5"	12.185	3	12 45 31.36	2.0791	9 37 31.5	11.470
4	11 11 7.71	1.9575	0 13 15.9	12.193	4	12 47 36.22	2.0831	9 48 58.5	11.431
5	11 13 5.21	1.9589	0 25 27.7	12.199	5	12 49 41.32	2.0870	10 0 23.2	11.391
6	11 15 2.80	1.9604	0 37 39.8	12.204	6	12 51 46.66	2.0910	10 11 45.5	11.340
7	11 17 0.47	1.9619	0 49 52.1	12.206	7	12 53 52.24	2.0950	10 23 5.2	11.306
8	11 18 58.23	1.9635	1 2 4.5	12.207	8	12 55 58.06	2.0991	10 34 22.3	11.264
9	11 20 56.07	1.9650	1 14 17.0	12.208	9	12 58 4.13	2.1033	10 45 36.9	11.220
10	11 22 54.01	1.9666	1 26 29.6	12.209	10	13 0 10.46	2.1075	10 56 48.8	11.175
11	11 24 52.06	1.9683	1 38 42.2	12.210	11	13 2 17.04	2.1117	11 7 57.9	11.128
12	11 26 50.21	1.9701	1 50 54.8	12.210	12	13 4 23.87	2.1159	11 19 4.1	11.080
13	11 28 48.46	1.9718	2 3 7.4	12.210	13	13 6 30.95	2.1202	11 30 7.4	11.030
14	11 30 46.82	1.9736	2 15 20.1	12.209	14	13 8 38.30	2.1247	11 41 7.7	10.980
15	11 32 45.28	1.9754	2 27 32.7	12.208	15	13 10 45.93	2.1292	11 52 5.0	10.929
16	11 34 43.86	1.9774	2 39 45.1	12.204	16	13 12 53.82	2.1337	12 2 59.2	10.877
17	11 36 42.56	1.9793	2 51 57.2	12.198	17	13 15 1.98	2.1382	12 13 50.2	10.824
18	11 38 41.37	1.9813	3 4 8.9	12.191	18	13 17 10.40	2.1428	12 24 38.1	10.770
19	11 40 40.31	1.9833	3 16 20.2	12.185	19	13 19 19.10	2.1473	12 35 22.7	10.716
20	11 42 39.38	1.9854	3 28 31.1	12.177	20	13 21 28.08	2.1519	12 46 3.8	10.658
21	11 44 38.57	1.9877	3 40 41.5	12.170	21	13 23 37.34	2.1567	12 56 41.5	10.599
22	11 46 37.90	1.9899	3 52 51.5	12.161	22	13 25 46.89	2.1615	13 7 15.7	10.540
23	11 48 37.37	1.9922	4 5 1.0	12.152	23	13 27 56.73	2.1663	13 17 46.3	10.479
24	11 50 36.97	1.9946	S. 4° 17' 9.9"	12.140	24	13 30 6.85	2.1713	S. 13° 28' 13.2"	10.417

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 9.					WEDNESDAY 11.				
0	^h 13 ^m 30 ^s 6.85	2.1713	S. 13° 28' 13.2	10.417	0	^h 15 ^m 20 ^s 21.41	2.3286	S. 20° 14' 37.9	6.080
1	13 32 17.27	2.1761	13 38 36.3	1.364	1	15 22 47.10	2.4300	20 20 37.2	6.298
2	13 34 27.98	2.1810	13 48 55.6	10.390	2	15 25 13.10	2.4360	20 26 29.2	6.807
3	13 36 38.98	2.1860	13 59 11.1	10.226	3	15 27 39.41	2.4410	20 32 14.0	6.886
4	13 38 50.28	2.1908	14 9 22.6	10.161	4	15 30 6.03	2.4461	20 37 51.4	6.800
5	13 41 1.88	2.1958	14 19 30.2	10.084	5	15 32 32.95	2.4512	20 43 21.3	6.426
6	13 43 13.77	2.2007	14 29 33.7	10.024	6	15 35 0.17	2.4562	20 48 43.6	6.310
7	13 45 25.96	2.2057	14 39 33.0	9.963	7	15 37 27.69	2.4611	20 53 58.5	6.184
8	13 47 38.46	2.2108	14 49 28.1	9.884	8	15 40 55.50	2.4660	20 59 5.7	6.068
9	13 49 51.26	2.2160	14 59 19.0	9.814	9	15 42 23.60	2.4708	21 4 5.2	4.980
10	13 52 4.37	2.2211	15 9 5.6	9.741	10	15 44 51.99	2.4756	21 8 57.1	4.799
11	13 54 17.79	2.2263	15 18 47.8	9.666	11	15 47 20.67	2.4804	21 13 41.1	4.666
12	13 56 31.52	2.2314	15 28 25.4	9.589	12	15 49 49.63	2.4850	21 18 17.1	4.534
13	13 58 45.56	2.2366	15 37 58.3	9.510	13	15 52 18.87	2.4896	21 22 45.0	4.401
14	14 0 59.92	2.2420	15 47 26.5	9.431	14	15 54 48.38	2.4940	21 27 5.0	4.268
15	14 3 14.61	2.2473	15 56 49.9	9.352	15	15 57 18.16	2.4984	21 31 17.1	4.133
16	14 5 29.62	2.2527	16 6 8.7	9.273	16	15 59 48.21	2.5028	21 35 21.0	3.996
17	14 7 44.94	2.2580	16 15 22.6	9.192	17	16 2 18.52	2.5074	21 39 16.5	3.866
18	14 10 0.56	2.2633	16 24 31.6	9.109	18	16 4 49.08	2.5118	21 43 3.6	3.716
19	14 12 16.51	2.2686	16 33 35.6	9.026	19	16 7 19.90	2.5166	21 46 42.3	3.573
20	14 14 32.78	2.2739	16 42 34.5	8.940	20	16 9 50.97	2.5200	21 50 12.5	3.433
21	14 16 49.37	2.2792	16 51 28.3	8.863	21	16 12 22.30	2.5241	21 53 34.3	3.291
22	14 19 6.29	2.2847	17 0 16.8	8.784	22	16 14 53.87	2.5280	21 56 47.5	3.148
23	14 21 23.54	2.2901	S. 17° 9' 0.0	8.673	23	16 17 25.66	2.5318	S. 21° 59' 52.1	3.006
TUESDAY 10.					THURSDAY 12.				
0	14 23 41.12	2.2957	S. 17° 17' 37.7	8.583	0	16 19 57.68	2.5366	S. 22° 2' 48.1	2.863
1	14 25 59.03	2.3012	17 26 10.0	8.492	1	16 22 29.93	2.5392	22 5 35.7	2.720
2	14 28 17.26	2.3066	17 34 36.7	8.399	2	16 25 2.39	2.5428	22 8 14.6	2.576
3	14 30 35.82	2.3120	17 42 57.8	8.306	3	16 27 35.05	2.5463	22 10 44.8	2.432
4	14 32 54.71	2.3175	17 51 13.3	8.210	4	16 30 7.93	2.5497	22 13 6.3	2.288
5	14 35 13.93	2.3229	17 59 23.0	8.114	5	16 32 41.03	2.5532	22 15 18.9	2.136
6	14 37 33.48	2.3286	18 7 26.9	8.017	6	16 35 14.34	2.5567	22 17 22.6	1.987
7	14 39 53.36	2.3340	18 15 24.9	7.918	7	16 37 47.84	2.5600	22 19 17.4	1.840
8	14 42 13.57	2.3396	18 23 16.9	7.818	8	16 40 21.52	2.5630	22 21 3.3	1.691
9	14 44 34.12	2.3460	18 31 2.9	7.716	9	16 42 55.38	2.5659	22 22 40.3	1.543
10	14 46 54.09	2.3506	18 38 42.9	7.617	10	16 45 29.41	2.5688	22 24 8.3	1.391
11	14 49 16.19	2.3560	18 46 16.7	7.513	11	16 48 3.62	2.5716	22 25 27.2	1.239
12	14 51 37.73	2.3616	18 53 44.3	7.407	12	16 50 38.00	2.5743	22 26 37.0	1.087
13	14 53 59.60	2.3673	19 1 5.3	7.300	13	16 53 12.53	2.5768	22 27 37.7	0.936
14	14 56 21.79	2.3736	19 8 19.8	7.189	14	16 55 47.21	2.5792	22 28 29.2	0.783
15	14 58 44.30	2.3790	19 15 27.8	7.080	15	16 58 22.03	2.5816	22 29 11.5	0.630
16	15 1 7.14	2.3834	19 22 29.3	6.970	16	17 0 57.00	2.5839	22 29 44.8	0.479
17	15 3 30.30	2.3888	19 29 24.2	6.860	17	17 3 32.10	2.5861	22 30 9.0	0.326
18	15 5 53.79	2.3943	19 36 12.5	6.748	18	17 6 7.33	2.5882	22 30 23.9	0.176
19	15 8 17.60	2.3996	19 42 54.0	6.636	19	17 8 42.69	2.5902	22 30 29.3	0.012
20	15 10 41.73	2.4048	19 49 28.7	6.521	20	17 11 18.16	2.5920	22 30 25.3	0.146
21	15 13 6.17	2.4100	19 55 56.5	6.407	21	17 13 53.73	2.5938	22 30 12.0	0.303
22	15 15 30.94	2.4163	20 2 17.4	6.290	22	17 16 29.41	2.5965	22 29 49.1	0.450
23	15 17 56.02	2.4206	20 8 31.3	6.171	23	17 19 5.19	2.5970	22 29 16.8	0.614
24	15 20 21.41	2.4268	S. 20° 14' 37.9	6.060	24	17 21 41.05	2.5983	S. 22° 28' 35.2	0.769

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 13.					SUNDAY 15.				
0	17 21 41.05	2.5993	S. 22° 28' 35.2"	0.769	0	19 25 53.07	2.5978	S. 18° 54' 52.8"	7.936
1	17 24 16.98	2.5995	22 27 44.4	0.926	1	19 28 25.21	2.5946	18 46 53.2	8.066
2	17 26 52.98	2.6006	22 26 44.3	1.080	2	19 30 57.14	2.5904	18 38 45.8	8.186
3	17 29 29.04	2.6018	22 25 34.9	1.236	3	19 33 28.86	2.5868	18 30 30.8	8.313
4	17 32 5.16	2.6026	22 24 16.0	1.393	4	19 36 0.36	2.5829	18 22 8.3	8.428
5	17 34 41.34	2.6034	22 22 47.6	1.550	5	19 38 31.63	2.5194	18 13 38.3	8.593
6	17 37 17.57	2.6043	22 21 9.9	1.707	6	19 41 2.67	2.5156	18 5 0.9	8.666
7	17 39 53.84	2.6048	22 19 22.7	1.864	7	19 43 33.49	2.5118	17 56 16.0	8.809
8	17 42 30.14	2.6053	22 17 26.1	2.021	8	19 46 4.08	2.5079	17 47 23.7	8.982
9	17 45 6.48	2.6057	22 15 20.2	2.178	9	19 48 34.44	2.5040	17 38 24.1	9.063
10	17 47 42.84	2.6060	22 13 4.7	2.336	10	19 51 4.56	2.5001	17 29 17.4	9.172
11	17 50 19.20	2.6062	22 10 39.8	2.494	11	19 53 34.44	2.4962	17 20 3.6	9.288
12	17 52 55.57	2.6061	22 8 5.4	2.650	12	19 56 4.09	2.4923	17 10 42.8	9.409
13	17 55 31.93	2.6060	22 5 21.7	2.806	13	19 58 33.50	2.4883	17 1 15.4	9.516
14	17 58 8.27	2.6056	22 2 28.8	2.961	14	20 1 2.66	2.4839	16 51 41.2	9.627
15	18 0 44.59	2.6053	21 59 26.5	3.117	15	20 3 31.56	2.4798	16 42 0.2	9.738
16	18 3 20.90	2.6049	21 56 14.8	3.273	16	20 6 0.21	2.4764	16 32 12.5	9.849
17	18 5 57.18	2.6043	21 52 53.7	3.429	17	20 8 28.61	2.4719	16 22 18.3	9.968
18	18 8 33.42	2.6037	21 49 23.3	3.585	18	20 10 56.75	2.4669	16 12 17.7	10.066
19	18 11 9.62	2.6029	21 45 43.6	3.739	19	20 13 24.63	2.4626	16 2 10.6	10.170
20	18 13 45.77	2.6023	21 41 54.6	3.894	20	20 15 52.25	2.4589	15 51 57.3	10.274
21	18 16 21.88	2.6014	21 37 56.4	4.048	21	20 18 19.61	2.4539	15 41 37.8	10.376
22	18 18 57.93	2.6001	21 33 48.9	4.203	22	20 20 46.71	2.4496	15 31 12.2	10.476
23	18 21 33.90	2.5989	S. 21° 29' 32.2"	4.354	23	20 23 13.55	2.4451	S. 15° 20' 40.6"	10.576
SATURDAY 14.					MONDAY 16.				
0	18 24 9.79	2.5976	S. 21° 25' 6.4"	4.507	0	20 25 40.12	2.4407	S. 15° 10' 3.2"	10.672
1	18 26 45.59	2.5969	21 20 31.5	4.647	1	20 28 6.43	2.4362	14 59 20.0	10.767
2	18 29 21.30	2.5943	21 15 47.6	4.807	2	20 30 32.47	2.4317	14 48 31.2	10.860
3	18 31 56.91	2.5926	21 10 54.6	4.968	3	20 32 58.23	2.4273	14 37 36.9	10.962
4	18 34 32.42	2.5911	21 5 52.5	5.109	4	20 35 23.73	2.4227	14 26 37.0	11.044
5	18 37 7.83	2.5894	21 0 41.5	5.269	5	20 37 48.96	2.4189	14 15 31.6	11.185
6	18 39 43.14	2.5874	20 55 21.6	5.407	6	20 40 13.93	2.4137	14 4 20.9	11.293
7	18 42 18.33	2.5853	20 49 52.7	5.565	7	20 42 38.62	2.4092	13 53 4.9	11.309
8	18 44 53.39	2.5833	20 44 15.0	5.703	8	20 45 3.04	2.4047	13 41 43.8	11.384
9	18 47 28.32	2.5813	20 38 28.4	5.849	9	20 47 27.19	2.4003	13 30 17.6	11.478
10	18 50 3.12	2.5790	20 32 33.1	5.993	10	20 49 51.07	2.3967	13 18 46.6	11.560
11	18 52 37.78	2.5766	20 26 29.2	6.136	11	20 52 14.68	2.3919	13 7 10.6	11.641
12	18 55 12.29	2.5739	20 20 16.8	6.278	12	20 54 38.02	2.3867	12 55 22.8	11.730
13	18 57 46.65	2.5714	20 13 55.9	6.430	13	20 57 1.10	2.3823	12 43 44.4	11.796
14	19 0 20.85	2.5687	20 7 26.4	6.563	14	20 59 23.90	2.3777	12 31 54.6	11.868
15	19 2 54.89	2.5660	20 0 48.3	6.708	15	21 1 46.43	2.3738	12 20 0.5	11.940
16	19 5 28.76	2.5631	19 54 1.7	6.847	16	21 4 8.70	2.3699	12 8 2.0	12.010
17	19 8 2.45	2.5601	19 47 6.7	6.986	17	21 6 30.70	2.3646	11 55 59.3	12.080
18	19 10 35.97	2.5570	19 40 3.4	7.123	18	21 8 52.44	2.3600	11 43 52.3	12.148
19	19 13 9.30	2.5540	19 32 51.9	7.260	19	21 11 13.91	2.3566	11 31 41.3	12.216
20	19 15 42.44	2.5508	19 25 32.2	7.396	20	21 13 35.11	2.3513	11 19 26.5	12.280
21	19 18 15.40	2.5476	19 18 4.4	7.530	21	21 15 56.05	2.3468	11 7 7.8	12.343
22	19 20 48.16	2.5444	19 10 28.5	7.664	22	21 18 16.72	2.3434	10 54 45.3	12.404
23	19 23 20.72	2.5410	19 2 44.7	7.797	23	21 20 37.13	2.3380	10 42 19.2	12.464
24	19 25 53.07	2.5378	S. 18° 54' 52.8"	7.928	24	21 22 57.28	2.3336	S. 10° 29' 49.6"	12.591

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 17.					THURSDAY 19.				
0	21 22 57.28	2.3336	S. 10 29 49.6	12.521	0	23 10 37.75	2.1686	N. 0 7 17.0	12.437
1	21 25 17.17	2.3293	10 17 16.6	12.576	1	23 12 47.79	2.1683	0 20 42.7	12.421
2	21 27 36.81	2.3251	10 4 40.4	12.630	2	23 14 57.70	2.1641	0 34 7.4	12.403
3	21 29 56.20	2.3209	9 52 0.9	12.683	3	23 17 7.48	2.1618	0 47 30.9	12.383
4	21 32 15.33	2.3167	9 39 18.2	12.734	4	23 19 17.12	2.1595	1 0 53.2	12.363
5	21 34 34.21	2.3125	9 26 32.6	12.785	5	23 21 26.63	2.1574	1 14 13.3	12.341
6	21 36 52.83	2.3083	9 13 44.0	12.834	6	23 23 36.01	2.1553	1 27 34.0	12.317
7	21 39 11.20	2.3041	9 0 52.5	12.881	7	23 25 45.27	2.1533	1 40 52.3	12.292
8	21 41 29.33	2.3000	8 47 58.3	12.923	8	23 27 54.41	2.1513	1 54 9.1	12.267
9	21 43 47.21	2.2960	8 35 1.5	12.969	9	23 30 3.42	2.1493	2 7 24.4	12.243
10	21 46 4.85	2.2920	8 22 2.0	13.011	10	23 32 12.32	2.1474	2 20 38.0	12.214
11	21 48 22.25	2.2881	8 9 0.1	13.052	11	23 34 21.11	2.1454	2 33 49.9	12.186
12	21 50 39.42	2.2843	7 55 55.9	13.090	12	23 36 29.78	2.1436	2 47 0.1	12.155
13	21 52 56.35	2.2805	7 42 49.5	13.125	13	23 38 38.35	2.1419	3 0 8.5	12.124
14	21 55 13.04	2.2768	7 29 41.1	13.158	14	23 40 46.82	2.1403	3 13 14.9	12.090
15	21 57 29.50	2.2732	7 16 30.6	13.190	15	23 42 55.20	2.1386	3 26 19.2	12.056
16	21 59 45.72	2.2696	7 3 18.1	13.222	16	23 45 3.47	2.1370	3 39 21.5	12.021
17	22 2 1.71	2.2660	6 50 3.8	13.263	17	23 47 11.64	2.1354	3 52 21.6	12.985
18	22 4 17.48	2.2625	6 36 47.7	13.292	18	23 49 19.72	2.1339	4 5 19.6	12.947
19	22 6 33.02	2.2591	6 23 29.9	13.310	19	23 51 27.71	2.1326	4 18 15.3	12.909
20	22 8 48.34	2.2554	6 10 10.6	13.336	20	23 53 35.62	2.1311	4 31 8.7	12.870
21	22 11 3.43	2.2497	5 56 49.7	13.360	21	23 55 43.44	2.1297	4 43 59.7	12.830
22	22 13 18.30	2.2461	5 43 27.3	13.382	22	23 57 51.18	2.1283	4 56 48.3	12.789
23	22 15 32.96	2.2426	S. 5 30 3.7	13.403	23	23 59 58.84	2.1271	N. 5 9 34.3	12.746
WEDNESDAY 18.					FRIDAY 20.				
0	22 17 47.41	2.2390	S. 5 16 38.9	13.422	0	0 2 6.43	2.1259	N. 5 22 17.7	12.702
1	22 20 1.64	2.2355	5 3 13.0	13.440	1	0 4 13.94	2.1247	5 34 58.5	12.657
2	22 22 15.67	2.2321	4 49 46.2	13.455	2	0 6 21.38	2.1236	5 47 36.5	12.612
3	22 24 29.50	2.2287	4 36 18.5	13.469	3	0 8 28.74	2.1224	6 0 11.8	12.566
4	22 26 43.12	2.2253	4 22 49.9	13.482	4	0 10 36.04	2.1213	6 12 44.3	12.517
5	22 28 56.54	2.2221	4 9 20.6	13.493	5	0 12 43.28	2.1203	6 25 13.8	12.467
6	22 31 9.77	2.2189	3 55 50.7	13.503	6	0 14 50.47	2.1193	6 37 40.3	12.417
7	22 33 22.81	2.2158	3 42 20.2	13.511	7	0 16 57.60	2.1183	6 50 3.9	12.367
8	22 35 35.67	2.2127	3 28 49.3	13.518	8	0 19 4.67	2.1173	7 2 24.4	12.317
9	22 37 48.34	2.2097	3 15 18.1	13.523	9	0 21 11.68	2.1164	7 14 41.8	12.264
10	22 40 0.83	2.2067	3 1 46.6	13.527	10	0 23 18.64	2.1155	7 26 56.1	12.210
11	22 42 13.14	2.2037	2 48 14.9	13.529	11	0 25 25.56	2.1146	7 39 7.0	12.155
12	22 44 25.27	2.2007	2 34 43.0	13.530	12	0 27 32.44	2.1142	7 51 14.6	12.100
13	22 46 37.22	2.1978	2 21 11.1	13.531	13	0 29 39.27	2.1134	8 3 19.0	12.044
14	22 48 49.00	2.1948	2 7 39.3	13.529	14	0 31 46.05	2.1126	8 15 19.9	11.986
15	22 51 0.60	2.1919	1 54 7.7	13.525	15	0 33 52.79	2.1120	8 27 17.2	11.927
16	22 53 12.03	2.1890	1 40 36.3	13.521	16	0 35 59.50	2.1115	8 39 11.0	11.868
17	22 55 23.30	2.1863	1 27 5.2	13.517	17	0 38 6.18	2.1110	8 51 1.3	11.808
18	22 57 34.40	2.1837	1 13 34.4	13.510	18	0 40 12.83	2.1105	9 2 48.0	11.748
19	22 59 45.34	2.1811	1 0 4.1	13.499	19	0 42 19.45	2.1101	9 14 31.0	11.686
20	23 1 56.13	2.1785	0 46 34.5	13.489	20	0 44 26.04	2.1097	9 26 10.3	11.624
21	23 4 6.76	2.1759	0 33 5.5	13.477	21	0 46 32.61	2.1094	9 37 45.9	11.561
22	23 6 17.23	2.1734	0 19 37.2	13.464	22	0 48 39.16	2.1090	9 49 17.7	11.497
23	23 8 27.56	2.1710	S. 0 6 9.7	13.452	23	0 50 45.69	2.1086	10 0 45.6	11.433
24	23 10 37.75	2.1686	N. 0 7 17.0	13.437	24	0 52 52.20	2.1083	N. 10 12 9.6	11.367

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 21.					MONDAY 23.				
0	0 52 52.20	2.1083	N.10 12 9.6	11.367	0	2 34 14.95	2.1230	N.17 49 2.6	7.444
1	0 54 58.69	2.1081	10 23 29.6	11.301	1	2 36 22.34	2.1236	17 56 26.4	7.360
2	0 57 5.17	2.1079	10 34 45.7	11.235	2	2 38 29.77	2.1242	18 3 44.5	7.265
3	0 59 11.64	2.1078	10 45 57.7	11.165	3	2 40 37.25	2.1249	18 10 57.0	7.160
4	1 1 18.10	2.1076	10 57 5.5	11.095	4	2 42 44.77	2.1255	18 18 3.7	7.054
5	1 3 24.55	2.1074	11 8 9.1	11.026	5	2 44 52.32	2.1262	18 25 4.7	6.968
6	1 5 30.99	2.1073	11 19 8.6	10.958	6	2 46 59.91	2.1268	18 31 59.9	6.871
7	1 7 37.42	2.1072	11 30 3.9	10.887	7	2 49 7.54	2.1275	18 38 49.3	6.774
8	1 9 43.85	2.1072	11 40 55.0	10.818	8	2 51 15.21	2.1281	18 45 32.9	6.678
9	1 11 50.28	2.1073	11 51 41.7	10.740	9	2 53 22.93	2.1288	18 52 10.6	6.581
10	1 13 56.72	2.1073	12 2 23.9	10.666	10	2 55 30.69	2.1295	18 58 42.5	6.484
11	1 16 3.16	2.1073	12 13 1.8	10.595	11	2 57 38.48	2.1301	19 5 8.6	6.387
12	1 18 9.60	2.1074	12 23 35.4	10.522	12	2 59 46.41	2.1307	19 11 28.8	6.287
13	1 20 16.04	2.1075	12 34 4.4	10.448	13	3 1 54.17	2.1313	19 17 43.0	6.187
14	1 22 22.49	2.1076	12 44 28.8	10.371	14	3 4 2.06	2.1319	19 23 51.2	6.088
15	1 24 28.96	2.1077	12 54 48.7	10.293	15	3 6 9.99	2.1325	19 29 53.5	5.988
16	1 26 35.43	2.1079	13 5 3.9	10.217	16	3 8 17.95	2.1331	19 35 49.8	5.888
17	1 28 41.91	2.1081	13 15 14.5	10.138	17	3 10 25.95	2.1337	19 41 40.1	5.788
18	1 30 48.40	2.1083	13 25 20.4	10.066	18	3 12 33.99	2.1343	19 47 24.5	5.688
19	1 32 54.91	2.1086	13 35 21.5	9.980	19	3 14 42.07	2.1348	19 53 2.8	5.588
20	1 35 1.44	2.1089	13 45 17.9	9.901	20	3 16 50.18	2.1353	19 58 35.1	5.487
21	1 37 7.98	2.1092	13 55 9.6	9.821	21	3 18 58.31	2.1359	20 4 1.3	5.387
22	1 39 14.54	2.1095	14 4 56.4	9.738	22	3 21 6.48	2.1364	20 9 21.5	5.286
23	1 41 21.12	2.1098	N.14 14 38.2	9.655	23	3 23 14.68	2.1370	N.20 14 35.7	5.185
SUNDAY 22.					TUESDAY 24.				
0	1 43 27.72	2.1101	N.14 24 15.0	9.578	0	3 25 22.92	2.1376	N.20 19 43.8	5.083
1	1 45 34.34	2.1106	14 33 46.9	9.491	1	3 27 31.18	2.1380	20 24 45.7	4.981
2	1 47 40.99	2.1110	14 43 13.9	9.410	2	3 29 39.46	2.1384	20 29 41.5	4.879
3	1 49 47.66	2.1114	14 52 36.0	9.327	3	3 31 47.77	2.1388	20 34 31.2	4.777
4	1 51 54.36	2.1119	15 1 53.0	9.241	4	3 33 56.11	2.1392	20 39 14.7	4.674
5	1 54 1.08	2.1123	15 11 4.9	9.155	5	3 36 4.48	2.1397	20 43 52.0	4.570
6	1 56 7.83	2.1127	15 20 11.6	9.069	6	3 38 12.89	2.1403	20 48 23.1	4.467
7	1 58 14.61	2.1132	15 29 13.2	8.983	7	3 40 21.32	2.1407	20 52 48.0	4.364
8	2 0 21.42	2.1137	15 38 9.6	8.897	8	3 42 29.77	2.1411	20 57 6.7	4.261
9	2 2 28.27	2.1142	15 47 0.7	8.809	9	3 44 38.25	2.1415	21 1 19.3	4.157
10	2 4 35.14	2.1147	15 55 46.6	8.723	10	3 46 46.75	2.1419	21 5 25.6	4.052
11	2 6 42.04	2.1153	16 4 27.3	8.635	11	3 48 55.27	2.1423	21 9 25.6	3.947
12	2 8 48.98	2.1159	16 13 2.7	8.545	12	3 51 3.82	2.1426	21 13 19.3	3.843
13	2 10 55.95	2.1164	16 21 32.7	8.453	13	3 53 12.38	2.1428	21 17 6.8	3.739
14	2 13 2.95	2.1170	16 29 57.3	8.365	14	3 55 20.95	2.1430	21 20 48.0	3.635
15	2 15 9.99	2.1176	16 38 16.6	8.275	15	3 57 29.54	2.1432	21 24 23.0	3.530
16	2 17 17.06	2.1182	16 46 30.4	8.186	16	3 59 38.15	2.1435	21 27 51.7	3.426
17	2 19 24.17	2.1188	16 54 39.8	8.094	17	4 1 46.77	2.1437	21 31 14.1	3.322
18	2 21 31.32	2.1194	17 2 41.7	8.003	18	4 3 55.39	2.1439	21 34 30.3	3.215
19	2 23 38.50	2.1200	17 10 39.1	7.911	19	4 6 4.03	2.1441	21 37 40.1	3.110
20	2 25 45.72	2.1206	17 18 31.0	7.819	20	4 8 12.68	2.1442	21 40 43.6	3.005
21	2 27 52.98	2.1212	17 26 17.3	7.726	21	4 10 21.34	2.1443	21 43 40.8	2.900
22	2 30 0.27	2.1218	17 33 58.0	7.632	22	4 12 30.00	2.1444	21 46 31.7	2.795
23	2 32 7.59	2.1224	17 41 33.1	7.538	23	4 14 38.67	2.1444	21 49 16.4	2.691
24	2 34 14.95	2.1230	N.17 49 2.6	7.444	24	4 16 47.33	2.1445	N.21 51 54.7	2.585

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
WEDNESDAY 25.					FRIDAY 27.				
0	4 16 47.33	2.1445	N.21° 51' 54.7	2.666	0	5 50 17.65	2.1107	N.21° 54' 34.4	2.443
1	4 18 56.00	2.1445	21 54 26.6	2.480	1	6 1 24.62	2.1154	21 52 4.8	2.843
2	4 21 4.67	2.1445	21 56 52.2	2.375	2	6 3 31.51	2.1142	21 49 29.2	2.643
3	4 23 13.35	2.1445	21 59 11.5	2.369	3	6 5 38.33	2.1180	21 46 47.7	2.743
4	4 25 22.02	2.1444	22 1 24.4	2.163	4	6 7 46.07	2.1116	21 44 0.1	2.843
5	4 27 30.68	2.1443	22 3 31.0	2.066	5	6 9 52.72	2.1101	21 41 6.5	2.943
6	4 29 39.34	2.1443	22 5 31.2	1.960	6	6 11 58.28	2.1088	21 38 6.8	3.043
7	4 31 47.99	2.1441	22 7 25.0	1.845	7	6 14 4.77	2.1075	21 35 1.2	3.143
8	4 33 56.64	2.1440	22 9 12.5	1.789	8	6 16 11.18	2.1062	21 31 49.6	3.243
9	4 36 5.28	2.1439	22 10 53.7	1.683	9	6 18 17.50	2.1049	21 28 32.1	3.342
10	4 38 13.91	2.1437	22 12 28.5	1.577	10	6 20 23.75	2.1036	21 25 8.6	3.441
11	4 40 22.53	2.1436	22 13 56.9	1.471	11	6 22 29.92	2.1020	21 21 39.2	3.539
12	4 42 31.13	2.1433	22 15 19.0	1.316	12	6 24 36.00	2.1006	21 18 4.0	3.636
13	4 44 39.72	2.1430	22 16 34.7	1.209	13	6 26 41.99	2.0990	21 14 23.0	3.733
14	4 46 48.29	2.1426	22 17 44.1	1.103	14	6 28 47.89	2.0975	21 10 36.1	3.831
15	4 48 56.83	2.1423	22 18 47.1	0.997	15	6 30 53.71	2.0960	21 6 43.2	3.929
16	4 51 5.35	2.1419	22 19 43.8	0.891	16	6 32 59.43	2.0945	21 2 44.5	4.026
17	4 53 13.85	2.1415	22 20 34.1	0.786	17	6 35 5.06	2.0931	20 58 40.1	4.122
18	4 55 22.33	2.1411	22 21 18.1	0.680	18	6 37 10.61	2.0917	20 54 29.9	4.218
19	4 57 30.79	2.1407	22 21 55.7	0.575	19	6 39 16.07	2.0901	20 50 13.9	4.314
20	4 59 39.22	2.1403	22 22 27.0	0.470	20	6 41 21.43	2.0884	20 45 52.2	4.410
21	5 1 47.62	2.1397	22 22 52.0	0.364	21	6 43 26.69	2.0869	20 41 24.8	4.506
22	5 3 55.99	2.1393	22 23 10.6	0.258	22	6 45 31.86	2.0854	20 36 51.6	4.600
23	5 6 4.33	2.1388	N.22 23 22.9	0.154	23	6 47 36.94	2.0840	N.20 32 12.7	4.696
THURSDAY 26.					SATURDAY 28.				
0	5 8 12.64	2.1381	N.22 23 29.0	0.048	0	6 49 41.93	2.0823	N.20 27 28.0	4.790
1	5 10 20.91	2.1375	22 23 28.7	0.068	1	6 51 46.82	2.0806	20 22 37.7	4.884
2	5 12 29.14	2.1368	22 23 22.1	0.163	2	6 53 51.61	2.0790	20 17 41.8	4.978
3	5 14 37.33	2.1361	22 23 9.1	0.308	3	6 55 56.30	2.0773	20 12 40.3	5.071
4	5 16 45.48	2.1355	22 22 49.9	0.373	4	6 58 0.89	2.0756	20 7 33.3	5.163
5	5 18 53.59	2.1350	22 22 24.4	0.479	5	7 0 5.38	2.0741	20 2 20.8	5.256
6	5 21 1.67	2.1343	22 21 52.5	0.584	6	7 2 9.78	2.0726	19 57 2.7	5.346
7	5 23 9.70	2.1334	22 21 14.4	0.688	7	7 4 14.08	2.0709	19 51 39.2	5.437
8	5 25 17.67	2.1326	22 20 30.0	0.792	8	7 6 18.28	2.0690	19 46 10.2	5.529
9	5 27 25.59	2.1317	22 19 39.3	0.896	9	7 8 22.37	2.0673	19 40 35.7	5.619
10	5 29 33.46	2.1306	22 18 42.4	1.000	10	7 10 26.36	2.0656	19 34 55.8	5.710
11	5 31 41.28	2.1296	22 17 39.2	1.104	11	7 12 30.25	2.0640	19 29 10.5	5.799
12	5 33 49.05	2.1286	22 16 29.8	1.208	12	7 14 34.04	2.0623	19 23 19.9	5.897
13	5 35 56.75	2.1279	22 15 14.2	1.312	13	7 16 37.73	2.0606	19 17 24.1	5.976
14	5 38 4.39	2.1270	22 13 52.4	1.416	14	7 18 41.32	2.0590	19 11 23.0	6.063
15	5 40 11.98	2.1261	22 12 24.4	1.519	15	7 20 44.81	2.0573	19 5 16.5	6.151
16	5 42 19.52	2.1253	22 10 50.2	1.622	16	7 22 48.20	2.0557	18 59 4.8	6.239
17	5 44 27.00	2.1243	22 9 9.8	1.726	17	7 24 51.49	2.0539	18 52 47.8	6.327
18	5 46 34.43	2.1233	22 7 23.1	1.828	18	7 26 54.67	2.0521	18 46 25.5	6.414
19	5 48 41.79	2.1223	22 5 30.3	1.931	19	7 28 57.74	2.0503	18 39 58.1	6.500
20	5 50 49.09	2.1211	22 3 31.4	2.033	20	7 31 0.71	2.0487	18 33 25.5	6.586
21	5 52 56.32	2.1201	22 1 26.4	2.135	21	7 33 3.59	2.0471	18 26 47.8	6.671
22	5 55 3.50	2.1191	21 59 15.2	2.237	22	7 35 6.36	2.0454	18 20 4.9	6.757
23	5 57 10.61	2.1179	21 56 57.9	2.339	23	7 37 9.03	2.0438	18 13 16.9	6.843
24	5 59 17.65	2.1167	N.21 54 34.4	2.442	24	7 39 11.59	2.0418	N.18 6 23.9	6.929

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

PHASES OF THE MOON.

		d	h	m
○ Full Moon,	3	10	25.1	
☾ Last Quarter,	10	22	46.7	
● New Moon,	17	15	6.6	
☾ First Quarter,	25	0	34.1	

	d	h
☾ Perigee,	15	11.4
☾ Apogee,	27	5.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Arietis W.	70° 21' 41"	3073	71° 50' 23"	3067	73° 19' 13"	3062	74° 48' 9"	3066
	Mars W.	66 9 30	3248	67 34 42	3244	68 59 59	3238	70 25 23	3233
	Aldebaran W.	37 25 11	3103	38 53 17	3094	40 21 34	3087	41 50 0	3078
	Regulus E.	42 44 28	3093	41 15 56	3079	39 47 21	3077	38 18 44	3076
	Saturn E.	80 5 59	3064	78 37 5	3060	77 8 6	3055	75 39 1	3050
	Spica E.	96 32 30	3042	95 3 9	3037	93 33 42	3032	92 4 9	3026
	Jupiter E.	101 57 53	3069	100 29 6	3060	99 0 12	3058	97 31 11	3052
2	α Arietis W.	82 14 37	3027	83 44 16	3021	85 14 3	3014	86 43 58	3008
	Mars W.	77 34 0	3204	79 0 5	3198	80 26 17	3191	81 52 37	3185
	Aldebaran W.	49 14 44	3038	50 44 10	3030	52 13 45	3022	53 43 30	3016
	Regulus E.	30 55 10	3071	29 26 25	3073	27 57 43	3076	26 29 4	3080
	Saturn E.	68 12 6	3026	66 42 25	3020	65 12 37	3016	63 42 43	3010
	Spica E.	84 34 44	2999	83 4 30	2993	81 34 8	2987	80 3 39	2981
	Jupiter E.	90 4 21	3024	88 34 38	3018	87 4 47	3011	85 34 48	3006
3	α Arietis W.	94 15 29	2977	95 46 11	2969	97 17 2	2963	98 48 1	2956
	Mars W.	89 6 15	3161	90 33 23	3143	92 0 40	3137	93 28 5	3129
	Aldebaran W.	61 14 37	2977	62 45 19	2969	64 16 11	2961	65 47 13	2954
	Pollux W.	20 59 40	3460	22 21 0	3366	23 43 32	3329	25 7 10	3377
	Saturn E.	56 11 36	2985	54 41 4	2980	53 10 26	2976	51 39 42	2970
	Spica E.	72 29 15	2948	70 57 57	2942	69 26 31	2936	67 54 57	2928
	Jupiter E.	78 2 55	2972	76 32 7	2965	75 1 11	2959	73 30 7	2953
	Antares E.	117 56 49	2958	116 25 44	2951	114 54 30	2944	113 23 7	2938
4	Mars W.	100 47 25	3091	102 15 45	3084	103 44 14	3076	105 12 53	3068
	Aldebaran W.	73 24 47	2915	74 56 47	2907	76 28 57	2899	78 1 17	2891
	Pollux W.	32 17 50	3107	33 45 51	3083	35 14 21	3061	36 43 18	3040
	Saturn E.	44 4 37	2950	42 33 22	2947	41 2 3	2945	39 30 41	2943
	Spica E.	60 14 51	2982	58 42 22	2885	57 9 44	2878	55 36 57	2870
	Jupiter E.	65 52 36	2917	64 20 39	2910	62 48 33	2903	61 16 18	2896
	Antares E.	105 43 55	2900	104 11 36	2893	102 39 8	2886	101 6 30	2877
5	Aldebaran W.	85 45 27	2952	87 18 47	2945	88 52 17	2936	90 25 58	2928
	Pollux W.	44 13 54	2956	45 45 2	2942	47 16 28	2927	48 48 12	2914
	Saturn E.	31 53 36	2947	30 22 17	2953	28 51 5	2959	27 20 1	2969
	Spica E.	47 50 36	2932	46 16 50	2925	44 42 55	2918	43 8 51	2911
	Jupiter E.	53 32 50	2862	51 59 42	2855	50 26 26	2848	48 53 1	2843
	Antares E.	93 20 52	2840	91 47 16	2831	90 13 28	2823	88 39 30	2816
6	Aldebaran W.	98 16 55	2789	99 51 37	2781	101 26 30	2772	103 1 34	2766
	Pollux W.	56 30 53	2864	58 4 11	2843	59 37 43	2832	61 11 29	2821
	Regulus W.	19 33 31	2924	21 5 20	2896	22 37 44	2871	24 10 40	2848
	Spica E.	35 16 0	2772	33 40 56	2765	32 5 42	2767	30 30 18	2750
	Jupiter E.	41 3 52	2811	39 29 38	2805	37 55 17	2799	36 20 48	2796
	Antares E.	80 47 8	2775	79 12 8	2768	77 36 58	2760	76 1 37	2751
7	Aldebaran W.	110 59 30	2726	112 35 37	2716	114 11 55	2708	115 48 24	2700
	Pollux W.	69 3 49	2769	70 38 58	2759	72 14 20	2749	73 49 55	2739
	Regulus W.	32 1 51	2762	33 37 9	2748	35 12 45	2735	36 48 39	2722
	Jupiter E.	28 27 8	2782	26 52 16	2783	25 17 26	2784	23 42 37	2788
	Antares E.	68 2 7	2710	66 25 40	2701	64 49 2	2693	63 12 13	2684
8	Pollux W.	81 51 8	2689	83 28 2	2680	85 5 9	2670	86 42 29	2660
	Regulus W.	44 52 17	2662	46 29 48	2661	48 7 34	2640	49 45 35	2628

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	<i>a</i> Arietis W.	76° 17' 13"	3051	77° 46' 23"	3045	79° 15' 40"	3039	80° 45' 5"	3033
	Mars W.	71 50 53	3228	73 16 29	3229	74 42 12	3216	76 8 2	3209
	Aldebaran W.	43 18 37	3069	44 47 24	3061	46 16 21	3053	47 45 28	3046
	Regulus E.	36 50 4	3073	35 21 22	3073	33 52 39	3073	32 23 55	3071
	Saturn E.	74 9 50	3046	72 40 34	3040	71 11 11	3035	69 41 42	3030
	Spica E.	90 34 29	3021	89 4 42	3016	87 34 49	3011	86 4 50	3005
	Jupiter E.	96 2 2	3047	94 32 47	3041	93 3 25	3036	91 33 57	3030
2	<i>a</i> Arietis W.	88 14 1	3002	89 44 11	2996	91 14 29	2989	92 44 55	2983
	Mars W.	83 19 4	3178	84 45 39	3173	86 12 22	3164	87 39 14	3157
	Aldebaran W.	55 13 24	3007	56 43 28	3000	58 13 41	2992	59 44 4	2984
	Regulus E.	25 0 30	3087	23 32 4	3086	22 3 48	3105	20 35 45	3119
	Saturn E.	62 12 43	3004	60 42 35	3000	59 12 22	3004	57 42 2	2999
	Spica E.	78 33 2	2976	77 2 18	2968	75 31 25	2962	74 0 24	2955
	Jupiter E.	84 4 42	3000	82 34 28	2993	81 4 6	2985	79 33 35	2978
3	<i>a</i> Arietis W.	100 19 9	2960	101 50 25	2943	103 21 49	2936	104 53 22	2929
	Mars W.	94 55 39	3123	96 23 21	3114	97 51 13	3107	99 19 14	3099
	Aldebaran W.	67 18 24	2946	68 49 45	2938	70 21 16	2930	71 52 57	2923
	Pollux W.	26 31 48	3234	27 57 17	3198	29 23 29	3164	30 50 21	3133
	Saturn E.	50 8 52	2965	48 37 56	2961	47 6 54	2959	45 35 48	2954
	Spica E.	66 23 14	2921	64 51 22	2914	63 19 21	2907	61 47 11	2899
	Jupiter E.	71 58 55	2946	70 27 34	2938	68 56 3	2931	67 24 24	2924
	Antares E.	111 51 36	2929	110 19 54	2923	108 48 3	2916	107 16 4	2908
4	Mars W.	106 41 42	3059	108 10 42	3052	109 39 51	3045	111 9 10	3036
	Aldebaran W.	79 33 47	2983	81 6 27	2976	82 39 17	2968	84 12 17	2960
	Pollux W.	38 12 41	3021	39 42 28	3004	41 12 36	2987	42 43 5	2971
	Saturn E.	37 59 17	2943	36 27 51	2942	34 56 25	2943	33 25 0	2943
	Spica E.	54 4 0	2892	52 30 53	2865	50 57 37	2848	49 24 11	2841
	Jupiter E.	59 43 54	2869	58 11 21	2862	56 38 39	2876	55 5 49	2869
	Antares E.	99 33 42	2869	98 0 44	2862	96 27 36	2855	94 54 19	2847
5	Aldebaran W.	91 59 49	2921	93 33 50	2913	95 8 1	2905	96 42 23	2797
	Pollux W.	50 20 13	2901	51 52 30	2890	53 25 2	2877	54 57 50	2866
	Saturn E.	25 49 10	2986	24 18 38	3003	22 48 29	3025	21 18 47	3052
	Spica E.	41 34 37	2903	40 0 12	2796	38 25 38	2788	36 50 54	2780
	Jupiter E.	47 19 28	2835	45 45 46	2829	44 11 56	2823	42 37 58	2817
	Antares E.	87 5 22	2808	85 31 4	2800	83 56 36	2792	82 21 57	2784
6	Aldebaran W.	104 36 48	2787	106 12 12	2749	107 47 47	2741	109 23 33	2732
	Pollux W.	62 45 29	2910	64 19 44	2900	65 54 12	2789	67 28 54	2779
	Regulus W.	25 44 6	2927	27 17 59	2909	28 52 15	2792	30 26 53	2777
	Spica E.	28 54 45	2743	26 19 2	2736	24 43 9	2729	23 7 7	2721
	Jupiter E.	34 46 13	2791	33 11 33	2787	31 36 48	2784	30 1 59	2782
	Antares E.	74 26 5	2743	72 50 22	2736	71 14 28	2729	69 38 23	2718
7	Aldebaran W.	117 25 4	2692	119 1 55	2684	120 38 56	2676	122 16 8	2668
	Pollux W.	75 25 43	2739	77 1 44	2719	78 37 59	2709	80 14 27	2699
	Regulus W.	38 24 50	2709	40 1 18	2697	41 38 2	2688	43 15 2	2674
	Jupiter E.	22 7 53	2797	20 33 21	2811	18 59 7	2829	17 25 17	2853
	Antares E.	61 35 12	2676	59 58 0	2668	58 20 37	2660	56 43 2	2650
8	Pollux W.	88 20 3	2640	89 57 50	2640	91 35 50	2630	93 14 4	2621
	Regulus W.	51 23 52	2617	53 2 24	2606	54 41 11	2595	56 20 13	2584

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
8	Antares	E.	55° 5' 15"	2641	53° 27' 16"	2633	51° 49' 6"	2624	50° 10' 44"	2615
	SUN	E.	126 34 23	2996	125 4 5	2986	123 33 33	2973	122 2 47	2962
9	Pollux	W.	94 52 31	2611	96 31 11	2601	98 10 4	2591	99 49 11	2582
	Regulus	W.	57 59 30	2573	59 39 2	2562	61 18 49	2551	62 58 52	2540
	Saturn	W.	21 45 40	2775	23 20 41	2738	24 56 31	2704	26 33 6	2673
	Antares	E.	41 55 53	2672	40 16 20	2664	38 36 35	2655	36 56 38	2648
	SUN	E.	114 25 28	2907	112 53 18	2896	111 20 53	2884	109 48 14	2873
10	Regulus	W.	71 22 54	2485	73 4 28	2473	74 46 19	2462	76 28 26	2452
	Saturn	W.	34 45 29	2553	36 25 29	2534	38 5 55	2517	39 46 45	2499
	Spica	W.	17 20 1	2489	19 1 30	2475	20 43 19	2461	22 25 27	2447
	SUN	E.	102 1 17	2915	100 27 9	2903	98 52 45	2792	97 18 6	2779
11	Regulus	W.	85 2 54	2396	86 46 34	2384	88 30 31	2373	90 14 44	2362
	Saturn	W.	48 16 41	2423	49 59 44	2408	51 43 7	2395	53 26 49	2382
	Spica	W.	31 0 46	2356	32 44 42	2373	34 28 55	2362	36 13 25	2350
	Jupiter	W.	25 48 24	2461	27 30 32	2443	29 13 6	2434	30 56 7	2406
	SUN	E.	89 20 57	2721	87 44 45	2709	86 8 17	2697	84 31 33	2686
12	Regulus	W.	98 59 44	2310	100 45 29	2300	102 31 29	2289	104 17 44	2279
	Saturn	W.	62 10 0	2319	63 55 32	2307	65 41 21	2296	67 27 27	2286
	Spica	W.	44 59 59	2296	46 46 5	2285	48 32 27	2274	50 19 5	2263
	Jupiter	W.	39 37 10	2329	41 22 27	2316	43 8 3	2303	44 53 58	2291
	SUN	E.	76 24 1	2629	74 45 45	2618	73 7 14	2607	71 28 29	2596
13	Saturn	W.	76 21 55	2233	78 9 33	2224	79 57 25	2214	81 45 31	2205
	Spica	W.	59 16 1	2215	61 4 6	2206	62 52 25	2196	64 40 58	2188
	Jupiter	W.	53 47 53	2235	55 35 28	2225	57 23 19	2215	59 11 24	2206
	SUN	E.	63 11 12	2548	61 31 5	2539	59 50 46	2530	58 10 15	2522
14	Saturn	W.	90 49 4	2169	92 38 18	2163	94 27 41	2157	96 17 13	2152
	Spica	W.	73 46 37	2162	75 36 17	2146	77 26 6	2140	79 16 4	2135
	Jupiter	W.	68 15 4	2166	70 4 23	2159	71 53 52	2153	73 43 31	2147
	Antares	W.	28 29 33	2194	30 18 9	2184	32 7 1	2174	33 56 7	2167
	SUN	E.	49 45 3	2489	48 3 35	2484	46 21 59	2479	44 40 16	2475
	α Arietis	E.	119 13 35	2190	117 24 52	2182	115 35 58	2176	113 46 54	2169
15	Saturn	W.	105 26 29	2136	107 16 34	2134	109 6 41	2134	110 56 49	2133
	Spica	W.	88 27 39	2116	90 18 14	2114	92 8 52	2112	93 59 33	2111
	Jupiter	W.	82 53 38	2126	84 43 57	2124	86 34 19	2122	88 24 44	2122
	Antares	W.	43 4 23	2136	44 54 27	2132	46 44 37	2130	48 34 51	2128
	SUN	E.	36 10 47	2470	34 28 51	2472	32 46 59	2475	31 5 11	2480
	α Arietis	E.	104 39 26	2147	102 49 38	2144	100 59 46	2141	99 9 50	2140
19	Antares	W.	101 10 6	2336	102 55 13	2351	104 39 58	2366	106 24 21	2381
	α Aquilæ	W.	52 6 22	3077	53 35 0	3059	55 4 0	3044	56 33 18	3033
	SUN	W.	18 57 0	2788	20 31 44	2797	22 6 24	2788	23 41 12	2792
	α Arietis	E.	46 52 43	2386	45 8 48	2406	43 25 20	2424	41 42 20	2445
	Mars	E.	60 46 1	2507	59 4 58	2522	57 24 16	2538	55 43 55	2554
	Aldebaran	E.	79 45 37	2348	78 0 47	2363	76 16 19	2378	74 32 13	2394
20	α Aquilæ	W.	64 2 24	3010	65 32 24	3012	67 2 22	3015	68 32 16	3021
	SUN	W.	31 32 36	2840	33 6 12	2854	34 39 30	2869	36 12 29	2884
	α Arietis	E.	33 15 1	2563	31 35 15	2592	29 56 9	2624	28 17 46	2656

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
8	Antares	E.	48° 32' 10"	2606	46° 53' 23"	2598	45° 14' 25"	2589	43° 35' 15"	2580
	SUN	E.	120 31 47	2962	119 0 34	2940	117 29 6	2929	115 57 24	2918
9	Pollux	W.	101 28 31	2572	103 8 4	2563	104 47 50	2553	106 27 49	2545
	Regulus	W.	64 39 10	2530	66 19 42	2518	68 0 30	2507	69 41 34	2496
	Saturn	W.	28 10 24	2643	29 48 21	2618	31 26 52	2594	33 5 55	2573
	Antares	E.	35 16 31	2641	33 36 15	2534	31 55 49	2626	30 15 12	2618
	SUN	E.	108 15 20	2861	106 42 11	2860	105 8 48	2838	103 35 10	2827
10	Regulus	W.	78 10 47	2441	79 53 24	2429	81 36 18	2417	83 19 29	2407
	Saturn	W.	41 28 0	2482	43 9 38	2467	44 51 38	2452	46 33 59	2437
	Spica	W.	24 7 55	2434	25 50 41	2422	27 33 45	2409	29 17 7	2397
	SUN	E.	95 43 11	2768	94 8 1	2758	92 32 35	2744	90 56 54	2732
11	Regulus	W.	91 59 14	2352	93 43 58	2341	95 28 58	2331	97 14 13	2320
	Saturn	W.	55 10 50	2368	56 55 10	2355	58 39 49	2343	60 24 46	2331
	Spica	W.	37 58 11	2339	39 43 14	2328	41 28 33	2317	43 14 8	2306
	Jupiter	W.	32 39 33	2389	34 23 24	2373	36 7 38	2357	37 52 14	2344
	SUN	E.	82 54 33	2674	81 17 18	2663	79 39 48	2651	78 2 2	2640
12	Regulus	W.	106 4 14	2270	107 50 57	2261	109 37 54	2251	111 25 5	2242
	Saturn	W.	69 13 49	2274	71 0 27	2263	72 47 21	2252	74 34 31	2243
	Spica	W.	52 5 59	2263	53 53 8	2243	55 40 32	2233	57 28 10	2225
	Jupiter	W.	46 40 11	2279	48 26 41	2267	50 13 29	2256	52 0 33	2245
	SUN	E.	69 49 29	2586	68 10 15	2576	66 30 47	2566	64 51 6	2557
13	Saturn	W.	83 33 51	2198	85 22 22	2190	87 11 5	2182	88 59 59	2175
	Spica	W.	66 29 43	2181	68 18 39	2173	70 7 47	2166	71 57 7	2159
	Jupiter	W.	60 59 42	2197	62 48 14	2189	64 36 58	2180	66 25 55	2172
	SUN	E.	56 29 32	2615	54 48 39	2607	53 7 36	2601	51 26 24	2494
14	Saturn	W.	98 6 53	2148	99 56 39	2144	101 46 31	2141	103 36 28	2138
	Spica	W.	81 6 10	2130	82 56 23	2126	84 46 43	2122	86 37 8	2118
	Jupiter	W.	75 33 18	2143	77 23 13	2137	79 13 15	2133	81 3 24	2130
	Antares	W.	35 45 25	2169	37 34 55	2162	39 24 35	2146	41 14 25	2140
	SUN	E.	42 58 28	2473	41 16 37	2470	39 34 42	2469	37 52 45	2468
	α Arietis	E.	111 57 39	2164	110 8 17	2159	108 18 47	2164	106 29 10	2149
15	Saturn	W.	112 46 59	2134	114 37 7	2135	116 27 14	2136	118 17 18	2138
	Spica	W.	95 50 16	2110	97 41 0	2110	99 31 44	2111	101 22 27	2111
	Jupiter	W.	90 15 10	2121	92 5 37	2122	93 56 2	2123	95 46 27	2126
	Antares	W.	50 25 8	2126	52 15 28	2126	54 5 49	2126	55 56 10	2124
	SUN	E.	29 23 29	2487	27 41 57	2496	26 0 38	2506	24 19 33	2517
	α Arietis	E.	97 19 52	2139	95 29 53	2139	93 39 54	2140	91 49 55	2141
19	Antares	W.	108 8 23	2397	109 52 2	2414	111 35 17	2431	113 18 8	2448
	α Aquilæ	W.	58 2 50	3022	59 32 35	3017	61 2 27	3013	62 32 24	3010
	SUN	W.	25 15 50	2798	26 50 21	2807	28 24 40	2818	29 58 45	2828
	α Arietis	E.	39 59 49	2467	38 17 49	2469	36 36 20	2512	34 55 24	2536
	Mars	E.	54 3 57	2570	52 24 21	2568	50 45 9	2604	49 6 20	2621
	Aldebaran	E.	72 48 30	2410	71 5 10	2426	69 22 13	2443	67 39 40	2461
20	α Aquilæ	W.	70 2 3	3026	71 31 43	3034	73 1 14	3042	74 30 35	3052
	SUN	W.	37 45 8	2899	39 17 28	2915	40 49 28	2931	42 21 7	2949
	α Arietis	E.	26 40 7	2692	25 3 17	2735	23 27 22	2779	21 52 27	2829

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
20	Mars E.	47° 27' 54"	2640	45° 49' 53"	2687	44° 12' 15"	2674	42° 35' 0"	2692
	Aldebaran E.	65 57 32	2477	64 15 47	2486	62 34 27	2614	60 53 33	2633
	Pollux E.	107 56 13	2630	106 15 28	2637	104 35 6	2653	102 55 6	2668
21	α Aquilæ W.	75 59 44	3061	77 28 41	3073	78 57 24	3064	80 25 53	3097
	SUN W.	43 52 24	2966	45 23 21	2982	46 53 56	2999	48 24 10	3016
	Mars E.	34 34 46	2792	32 59 54	2801	31 25 27	2818	29 51 23	2837
	Aldebaran E.	52 35 20	2624	50 56 57	2643	49 19 0	2662	47 41 29	2681
	Pollux E.	94 40 39	2652	93 2 54	2669	91 25 32	2686	89 48 33	2703
22	α Aquilæ W.	87 44 12	3106	89 10 59	3164	90 37 27	3201	92 3 35	3218
	SUN W.	55 50 1	3102	57 18 8	3119	58 45 55	3135	60 13 22	3162
	Aldebaran E.	39 40 25	2780	38 5 31	2800	36 31 3	2821	34 57 2	2842
	Pollux E.	81 49 20	2788	80 14 36	2806	78 40 14	2822	77 6 15	2838
	Regulus E.	118 40 13	2747	117 4 35	2792	115 29 17	2777	113 54 19	2782
23	SUN W.	67 25 46	2230	68 51 20	2245	70 16 36	2269	71 41 35	2278
	Pollux E.	69 21 34	2918	67 49 38	2926	66 18 3	2930	64 46 48	2966
	Regulus E.	106 4 21	2866	104 31 17	2879	102 58 31	2891	101 26 1	2906
24	SUN W.	78 42 32	3338	80 5 59	3360	81 29 13	3360	82 52 15	3372
	α Arietis W.	20 6 33	3212	21 32 28	3190	22 58 49	3173	24 25 31	3160
	Pollux E.	57 15 12	3030	55 45 47	3063	54 16 40	3067	52 47 50	3081
	Regulus E.	93 47 33	2964	92 16 35	2976	90 45 51	2986	89 15 20	2996
25	SUN W.	89 44 29	3418	91 6 25	3425	92 28 13	3432	93 49 52	3439
	α Arietis W.	31 41 45	3133	33 9 15	3131	34 36 47	3120	36 4 20	3130
	Pollux E.	45 27 57	3162	44 0 50	3166	42 34 0	3181	41 7 28	3196
	Regulus E.	81 45 41	3060	80 16 16	3046	78 47 0	3062	77 17 52	3069
	Saturn E.	117 51 9	3030	116 21 45	3046	114 52 28	3052	113 23 19	3066
26	SUN W.	100 36 26	3466	101 57 28	3470	103 18 26	3472	104 39 21	3475
	α Arietis W.	43 22 11	3120	44 49 45	3120	46 17 20	3129	47 44 55	3129
	Mars W.	24 33 40	3292	25 58 13	3286	27 22 42	3288	28 47 7	3291
	Pollux E.	33 59 35	3284	32 35 5	3307	31 11 2	3332	29 47 27	3366
	Regulus E.	69 54 1	3064	68 25 32	3088	66 57 8	3091	65 28 48	3094
	Saturn E.	105 58 57	3076	104 30 18	3078	103 1 42	3081	101 33 9	3082
	Spica E.	123 50 56	3066	122 22 5	3080	120 53 18	3072	119 24 34	3073
27	SUN W.	111 23 20	3492	112 44 4	3492	114 4 48	3481	115 25 33	3480
	α Arietis W.	55 3 2	3122	56 30 45	3120	57 58 30	3118	59 26 18	3114
	Mars W.	35 48 39	3296	37 12 55	3296	38 37 12	3294	40 1 30	3293
	Aldebaran W.	22 15 31	3226	23 41 9	3210	25 7 6	3196	26 33 21	3181
	Regulus E.	58 7 48	3102	56 39 41	3102	55 11 34	3102	53 43 27	3101
	Saturn E.	94 10 47	3086	92 42 20	3086	91 13 52	3084	89 45 23	3082
	Spica E.	112 1 19	3078	110 32 42	3077	109 4 4	3076	107 35 25	3075
	Jupiter E.	117 7 54	3077	115 39 16	3077	114 10 38	3076	112 41 58	3073
28	α Arietis W.	66 46 16	3096	68 14 30	3092	69 42 49	3087	71 11 14	3082
	Mars W.	47 3 36	3279	48 28 12	3276	49 52 52	3270	51 17 38	3268
	Aldebaran W.	33 48 12	3129	35 15 46	3121	36 43 30	3113	38 11 24	3103
	Regulus E.	46 22 41	3096	44 54 27	3094	43 26 10	3092	41 57 51	3090
	Saturn E.	82 22 20	3069	80 53 33	3066	79 24 42	3062	77 55 46	3058
	Spica E.	100 11 36	3061	98 42 39	3057	97 13 37	3053	95 44 30	3048
	Jupiter E.	105 17 53	3067	103 48 51	3063	102 19 44	3049	100 50 32	3043

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXTh.	P. L. of Dist.
20	Mars E.	40 58 9	2709	39 21 41	2798	37 45 38	2747	36 10 0	2768
	Aldebaran E.	59 13 5	2580	57 33 1	2586	55 53 22	2586	54 14 8	2605
	Pollux E.	101 15 27	2584	99 36 10	2601	97 57 16	2618	96 18 46	2635
21	α Aquilæ W.	81 54 6	3710	83 22 4	3724	84 49 44	3138	86 17 7	3183
	SUN W.	49 54 3	3034	51 23 34	3061	52 52 44	3068	54 21 33	3086
	Mars E.	28 17 43	2854	26 44 25	2872	25 11 30	2890	23 38 58	2907
	Aldebaran E.	46 4 24	2701	44 27 45	2790	42 51 32	2740	41 15 45	2760
	Pollux E.	88 11 57	2730	86 35 44	2737	84 59 53	2754	83 24 25	2772
22	α Aquilæ W.	93 29 23	3224	94 54 52	3262	96 20 0	3269	97 44 48	3286
	SUN W.	61 40 29	3108	63 7 16	3184	64 33 44	3199	65 59 54	3214
	Aldebaran E.	33 23 28	2864	31 50 23	2897	30 17 47	2909	28 45 40	2934
	Pollux E.	75 32 37	2855	73 59 19	2871	72 26 24	2867	70 53 49	2908
	Regulus E.	112 19 41	2807	110 45 22	2822	109 11 23	2837	107 37 43	2851
23	SUN W.	73 6 18	3288	74 30 44	3300	75 54 55	3313	77 18 51	3328
	Pollux E.	63 15 52	2981	61 45 15	2995	60 14 56	3009	58 44 55	3024
	Regulus E.	99 53 48	2917	98 21 51	2930	96 50 10	2942	95 18 44	2964
24	SUN W.	84 15 4	3382	85 37 41	3392	87 0 7	3400	88 22 23	3409
	α Arietis W.	25 52 29	3148	27 19 39	3143	28 46 56	3139	30 14 18	3135
	Pollux E.	51 19 17	3006	49 51 2	3109	48 23 3	3124	46 55 22	3137
	Regulus E.	87 45 2	3006	86 14 56	3014	84 45 1	3022	83 15 16	3030
25	SUN W.	95 11 24	3446	96 32 49	3453	97 54 6	3497	99 15 18	3481
	α Arietis W.	37 31 54	3130	38 59 28	3130	40 27 2	3130	41 54 36	3129
	Pollux E.	39 41 14	3213	38 15 19	3220	36 49 44	3246	35 24 29	3264
	Regulus E.	75 48 52	3066	74 20 0	3071	72 51 15	3075	71 22 35	3086
	Saturn E.	111 54 16	3081	110 25 19	3085	108 56 27	3099	107 27 40	3073
26	SUN W.	106 0 13	3478	107 21 2	3480	108 41 49	3480	110 2 35	3481
	α Arietis W.	49 12 30	3126	50 40 6	3127	52 7 43	3126	53 35 22	3124
	Mars W.	30 11 29	3294	31 35 48	3295	33 0 5	3296	34 24 22	3296
	Pollux E.	28 24 22	3398	27 1 52	3425	25 40 4	3465	24 19 1	3510
	Regulus E.	64 0 31	3090	63 32 16	3099	61 4 5	3101	59 35 56	3101
	Saturn E.	100 4 38	3084	98 36 9	3085	97 7 41	3086	95 39 14	3086
	Spica E.	117 55 50	3074	116 27 8	3076	114 58 29	3078	113 29 53	3079
27	SUN W.	116 46 21	3479	118 7 9	3476	119 28 0	3474	120 48 53	3471
	α Arietis W.	60 54 10	3112	62 22 5	3110	63 50 4	3106	65 18 8	3101
	Mars W.	41 25 50	3291	42 50 12	3290	44 14 36	3286	45 39 4	3282
	Aldebaran W.	27 59 53	3168	29 26 40	3166	30 53 39	3148	32 20 50	3139
	Regulus E.	52 15 20	3101	50 47 12	3100	49 19 3	3099	47 50 53	3098
	Saturn E.	88 16 52	3080	86 48 18	3078	85 19 42	3076	83 51 3	3073
	Spica E.	106 6 45	3073	104 38 3	3071	103 9 18	3068	101 40 29	3066
	Jupiter E.	111 13 16	3070	109 44 30	3068	108 15 41	3065	106 46 49	3062
28	α Arietis W.	72 39 45	3078	74 8 22	3072	75 37 6	3065	77 5 58	3066
	Mars W.	52 42 30	3261	54 7 27	3255	55 32 31	3249	56 57 42	3242
	Aldebaran W.	39 39 30	3096	41 7 46	3097	42 36 12	3076	44 4 49	3070
	Regulus E.	40 29 29	3088	39 1 5	3085	37 32 38	3083	36 4 8	3081
	Saturn E.	76 26 45	3053	74 57 38	3049	73 28 26	3044	71 59 8	3039
	Spica E.	94 15 17	3048	92 45 58	3039	91 16 33	3033	89 47 1	3026
	Jupiter E.	99 21 13	3039	97 51 48	3033	96 22 16	3027	94 52 37	3021

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.				
Sun.	1	^h 22 ^m 47 ^s 50.55	9.363	S. 7° 39' 11.0	56.90	16 10.38	65.44	^m 12 ^s 37.41	0.494	
Mon.	2	22 51 34.96	9.341	7 16 22.2	57.17	16 10.14	65.37	12 25.30	0.516	
Tues.	3	22 55 18.85	9.321	6 53 27.3	57.42	16 9.89	65.30	12 12.68	0.536	
Wed.	4	22 59 2.25	9.301	6 30 26.7	57.65	16 9.64	65.23	11 59.56	0.556	
Thur.	5	23 2 45.19	9.283	6 7 20.7	57.87	16 9.39	65.16	11 45.98	0.574	
Fri.	6	23 6 27.70	9.265	5 44 9.6	58.07	16 9.14	65.10	11 31.98	0.592	
Sat.	7	23 10 9.80	9.248	5 20 53.7	58.26	16 8.88	65.04	11 17.56	0.609	
Sun.	8	23 13 51.51	9.232	4 57 33.5	58.43	16 8.62	64.98	11 2.76	0.625	
Mon.	9	23 17 32.85	9.217	4 34 9.4	58.59	16 8.36	64.93	10 47.59	0.640	
Tues.	10	23 21 13.83	9.203	4 10 41.7	58.73	16 8.10	64.88	10 32.07	0.654	
Wed.	11	23 24 54.48	9.190	3 47 10.9	58.86	16 7.83	64.83	10 16.21	0.667	
Thur.	12	23 28 34.84	9.177	3 23 37.1	58.97	16 7.56	64.79	10 0.06	0.679	
Fri.	13	23 32 14.92	9.166	3 0 0.9	59.06	16 7.29	64.75	9 43.63	0.690	
Sat.	14	23 35 54.74	9.155	2 36 22.7	59.14	16 7.02	64.71	9 26.94	0.700	
Sun.	15	23 39 34.31	9.146	2 12 42.8	59.20	16 6.75	64.67	9 10.00	0.710	
Mon.	16	23 43 13.65	9.137	1 49 1.5	59.25	16 6.47	64.63	8 52.84	0.719	
Tues.	17	23 46 52.79	9.129	1 25 19.3	59.28	16 6.20	64.60	8 35.47	0.727	
Wed.	18	23 50 31.75	9.121	1 1 36.7	59.29	16 5.93	64.57	8 17.92	0.735	
Thur.	19	23 54 10.54	9.114	0 37 53.9	59.29	16 5.66	64.54	8 0.20	0.745	
Fri.	20	23 57 49.16	9.108	S. 0 14 11.3	59.27	16 5.38	64.52	7 42.32	0.745	
Sat.	21	0 1 27.65	9.103	N. 0 9 30.7	59.24	16 5.10	64.50	7 24.31	0.753	
Sun.	22	0 5 6.02	9.098	0 33 11.6	59.19	16 4.83	64.49	7 6.17	0.758	
Mon.	23	0 8 44.29	9.094	0 56 51.1	59.12	16 4.56	64.48	6 47.93	0.762	
Tues.	24	0 12 22.46	9.091	1 20 28.9	59.04	16 4.29	64.47	6 29.61	0.765	
Wed.	25	0 16 0.56	9.088	1 44 4.5	58.94	16 4.02	64.46	6 11.21	0.768	
Thur.	26	0 19 38.61	9.086	2 7 37.6	58.83	16 3.74	64.46	5 52.75	0.770	
Fri.	27	0 23 16.63	9.085	2 31 7.9	58.71	16 3.47	64.46	5 34.27	0.771	
Sat.	28	0 26 54.61	9.085	2 54 35.0	58.57	16 3.20	64.46	5 15.77	0.771	
Sun.	29	0 30 32.66	9.086	3 17 58.6	58.42	16 2.93	64.46	4 57.28	0.770	
Mon.	30	0 34 10.70	9.088	3 41 18.4	58.25	16 2.66	64.47	4 38.83	0.768	
Tues.	31	0 37 48.79	9.091	4 4 33.9	58.07	16 2.38	64.48	4 20.42	0.765	
Wed.	32	0 41 26.96	9.094	N. 4 27 44.8	57.87	16 2.11	64.50	4 2.09	0.762	

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		^h ^m ^s	^s	[°] ['] ["]	["]	^m ^s	^s	^h ^m ^s
Sun.	1	22 47 48.58	9.363	S. 7 39 23.0	56.90	12 37.51	0.494	22 35 11.07
Mon.	2	22 51 33.02	9.341	7 16 34.1	57.17	12 25.40	0.516	22 39 7.62
Tues.	3	22 55 16.95	9.321	6 53 39.1	57.42	12 12.78	0.536	22 43 4.17
Wed.	4	22 59 0.39	9.301	6 30 38.3	57.65	11 59.66	0.556	22 47 0.73
Thur.	5	23 2 43.37	9.283	6 7 32.1	57.87	11 46.09	0.574	22 50 57.28
Fri.	6	23 6 25.92	9.265	5 44 20.8	58.07	11 32.09	0.592	22 54 53.83
Sat.	7	23 10 8.06	9.248	5 21 4.7	58.26	11 17.67	0.609	22 58 50.39
Sun.	8	23 13 49.81	9.232	4 57 44.3	58.43	11 2.87	0.625	23 2 46.94
Mon.	9	23 17 31.19	9.217	4 34 20.0	58.59	10 47.70	0.640	23 6 43.49
Tues.	10	23 21 12.22	9.203	4 10 52.1	58.73	10 32.18	0.654	23 10 40.04
Wed.	11	23 24 52.92	9.190	3 47 21.0	58.86	10 16.32	0.667	23 14 36.60
Thur.	12	23 28 33.32	9.177	3 23 47.0	58.97	10 0.17	0.679	23 18 33.15
Fri.	13	23 32 13.44	9.166	3 0 10.6	59.06	9 43.74	0.690	23 22 29.70
Sat.	14	23 35 53.30	9.155	2 36 32.1	59.14	9 27.05	0.700	23 26 26.25
Sun.	15	23 39 32.92	9.146	2 12 51.9	59.20	9 10.11	0.710	23 30 22.81
Mon.	16	23 43 12.31	9.137	1 49 10.3	59.25	8 52.95	0.719	23 34 19.36
Tues.	17	23 46 51.49	9.129	1 25 27.8	59.28	8 35.58	0.727	23 38 15.91
Wed.	18	23 50 30.49	9.121	1 1 44.9	59.29	8 18.02	0.735	23 42 12.47
Thur.	19	23 54 9.32	9.114	0 38 1.8	59.29	8 0.30	0.742	23 46 9.02
Fri.	20	23 57 47.99	9.108	S. 0 14 18.9	59.27	7 42.42	0.748	23 50 5.57
Sat.	21	0 1 26.53	9.103	N. 0 9 23.4	59.24	7 24.41	0.753	23 54 2.12
Sun.	22	0 5 4.94	9.098	0 33 4.6	59.19	7 6.26	0.758	23 57 58.68
Mon.	23	0 8 43.25	9.094	0 56 44.4	59.12	6 48.02	0.762	0 1 55.23
Tues.	24	0 12 21.47	9.091	1 20 22.5	59.04	6 29.69	0.765	0 5 51.78
Wed.	25	0 15 59.62	9.088	1 43 58.4	58.94	6 11.29	0.768	0 9 48.33
Thur.	26	0 19 37.72	9.086	2 7 31.8	58.83	5 52.84	0.770	0 13 44.88
Fri.	27	0 23 15.78	9.085	2 31 2.4	58.71	5 34.34	0.771	0 17 41.44
Sat.	28	0 26 53.83	9.085	2 54 29.8	58.57	5 15.84	0.771	0 21 37.99
Sun.	29	0 30 31.90	0.086	3 17 53.7	58.42	4 57.35	0.770	0 25 34.55
Mon.	30	0 34 9.99	9.088	3 41 13.7	58.25	4 38.89	0.768	0 29 31.10
Tues.	31	0 37 48.13	9.091	4 4 29.5	58.07	4 20.48	0.765	0 33 27.65
Wed.	32	0 41 26.35	9.094	N. 4 27 40.9	57.87	4 2.15	0.762	0 37 24.20

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.			
		λ	λ'					
1	60	340° 27' 4.0	26' 38.4	150.37	—0.67	9.9962320	44.5	^h 1 ^m 24 ^s 35.04
2	61	341 27 11.7	26 46.0	150.28	0.76	.9963397	45.2	1 20 39.13
3	62	342 27 17.3	26 51.5	150.20	0.82	.9964490	45.9	1 16 43.22
4	63	343 27 21.0	26 55.1	150.12	0.84	.9965600	46.6	1 12 47.31
5	64	344 27 22.9	26 56.9	150.04	0.85	.9966726	47.2	1 8 51.40
6	65	345 27 23.0	26 56.9	149.97	0.82	.9967867	47.8	1 4 55.50
7	66	346 27 21.3	26 55.1	149.89	0.77	.9969022	48.4	1 0 59.59
8	67	347 27 17.7	26 51.4	149.82	0.68	.9970191	48.9	0 57 3.68
9	68	348 27 12.5	26 46.1	149.75	0.58	.9971372	49.4	0 53 7.77
10	69	349 27 5.7	26 39.2	149.68	0.46	.9972565	49.9	0 49 11.86
11	70	350 26 57.2	26 30.7	149.61	0.33	.9973769	50.3	0 45 15.96
12	71	351 26 46.9	26 20.3	149.54	0.19	.9974982	50.7	0 41 20.05
13	72	352 26 35.0	26 8.3	149.47	—0.06	.9976201	50.9	0 37 24.14
14	73	353 26 21.4	25 54.6	149.40	+0.05	.9977427	51.1	0 33 28.23
15	74	354 26 6.0	25 39.1	149.33	0.14	.9978655	51.2	0 29 32.33
16	75	355 25 48.8	25 21.8	149.25	0.22	.9979886	51.3	0 25 36.43
17	76	356 25 29.9	25 2.8	149.17	0.27	.9981117	51.3	0 21 40.52
18	77	357 25 9.1	24 41.9	149.09	0.31	.9982349	51.3	0 17 44.61
19	78	358 24 46.4	24 19.1	149.01	0.30	.9983579	51.3	0 13 48.70
20	79	359 24 21.6	23 54.2	148.93	0.25	.9984808	51.2	0 9 52.80
21	80	0 24 54.8	23 27.4	148.84	0.17	.9986035	51.1	0 5 56.90
22	81	1 23 26.0	22 58.5	148.75	+0.08	.9987260	51.0	^h 0 ^m 23 ^s 54 ^{ms} 9.17
23	82	2 22 55.0	22 27.4	148.66	—0.04	.9988482	50.9	23 54 9.17
24	83	3 22 21.8	21 54.1	148.57	0.17	.9989702	50.8	23 50 13.27
25	84	4 21 46.2	21 18.4	148.47	0.30	.9990920	50.8	23 46 17.37
26	85	5 21 8.1	20 40.2	148.37	0.44	.9992139	50.8	23 42 21.46
27	86	6 20 27.8	19 59.8	148.27	0.55	.9993359	50.8	23 38 25.55
28	87	7 19 45.2	19 17.1	148.18	0.66	.9994580	50.9	23 34 29.64
29	88	8 19 0.3	18 32.1	148.08	0.76	.9995804	51.1	23 30 33.73
30	89	9 18 13.1	17 44.8	147.98	0.82	.9997032	51.2	23 26 37.83
31	90	10 17 23.5	16 55.2	147.89	0.86	.9998264	51.3	23 22 41.92
32	91	11 16 31.7	16 3.3	147.90	—0.84	9.9999499	51.5	23 18 46.01

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	14 51.4	14 53.7	54 24.6	+0.64	54 33.3	+0.79	^h 9 ^m 21.5	1.92	^d 11.4
2	14 56.6	14 59.8	54 43.7	0.92	54 55.5	1.03	10 7.1	1.89	12.4
3	15 3.3	15 7.1	55 8.5	1.13	55 22.5	1.20	10 52.0	1.86	13.4
4	15 11.2	15 15.3	55 37.3	1.26	55 52.7	1.29	11 36.6	1.86	14.4
5	15 19.6	15 23.9	56 8.2	1.30	56 24.0	1.30	12 21.5	1.89	15.4
6	15 28.2	15 32.3	56 39.5	1.29	56 54.9	1.26	13 7.5	1.95	16.4
7	15 36.4	15 40.3	57 9.8	1.22	57 24.3	1.18	13 55.4	2.04	17.4
8	15 44.1	15 47.7	57 38.2	1.13	57 51.5	1.08	14 45.4	2.15	18.4
9	15 51.2	15 54.4	58 4.2	1.02	58 16.1	0.96	15 38.6	2.28	19.4
10	15 57.5	16 0.3	58 27.4	0.90	58 37.9	0.85	16 34.6	2.38	20.4
11	16 3.0	16 5.5	58 47.7	0.79	58 56.9	0.73	17 32.8	2.44	21.4
12	16 7.7	16 9.7	59 5.1	0.65	59 12.4	0.57	18 32.1	2.46	22.4
13	16 11.4	16 12.8	59 18.7	0.47	59 23.8	0.36	19 30.9	2.42	23.4
14	16 13.8	16 14.5	59 27.4	+0.23	59 29.4	+0.09	20 28.0	2.33	24.4
15	16 14.6	16 14.0	59 29.7	-0.06	59 28.2	-0.22	21 22.8	2.23	25.4
16	16 13.0	16 11.4	59 24.4	0.40	59 18.4	0.60	22 15.2	2.14	26.4
17	16 9.2	16 6.2	59 10.1	0.78	58 59.6	0.97	23 5.8	2.08	27.4
18	16 2.7	15 58.7	58 46.8	1.14	58 32.0	1.31	23 55.1	2.04	28.4
19	15 54.2	15 49.2	58 15.3	1.45	57 57.1	1.58	♄		29.4
20	15 43.9	15 38.3	57 37.6	1.68	57 17.2	1.72	0 43.8	2.03	0.9
21	15 32.7	15 27.0	56 56.4	1.74	56 35.4	1.73	1 32.5	2.04	1.9
22	15 21.4	15 16.0	56 14.8	1.69	55 54.8	1.61	2 21.6	2.05	2.9
23	15 10.8	15 6.0	55 36.0	1.51	55 18.5	1.38	3 11.1	2.07	3.9
24	15 1.7	14 57.9	55 2.7	1.24	54 48.8	1.06	4 0.9	2.07	4.9
25	14 54.8	14 52.2	54 37.1	0.88	54 27.8	0.67	4 50.5	2.06	5.9
26	14 50.3	14 49.1	54 20.9	0.48	54 16.5	-0.24	5 39.6	2.02	6.9
27	14 48.7	14 48.9	54 14.8	-0.03	54 15.6	+0.18	6 27.6	1.98	7.9
28	14 49.9	14 51.5	54 19.1	+0.40	54 25.1	0.61	7 14.5	1.93	8.9
29	14 53.8	14 56.7	54 33.6	0.81	54 44.3	0.99	8 0.2	1.90	9.9
30	15 0.3	15 4.3	54 57.3	1.16	55 12.2	1.31	8 45.1	1.86	10.9
31	15 8.8	15 13.7	55 28.7	1.43	55 46.6	1.54	9 29.6	1.86	11.9
32	15 18.8	15 24.2	56 5.5	+1.61	56 25.2	+1.66	10 14.4	1.89	12.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 1.					TUESDAY 3.				
0	7 ^h 39 ^m 11.59 ^s	2.0418	N.18° 6' 23.9"	6.929	0	9 ^h 15 ^m 27.06 ^s	1.9769	N.11° 7' 25.6"	10.306
1	7 41 14.05	2.0401	17 59 25.7	7.011	1	9 17 25.59	1.9761	10 57 5.6	10.361
2	7 43 16.41	2.0386	17 52 22.6	7.093	2	9 19 24.07	1.9742	10 46 42.3	10.416
3	7 45 18.68	2.0368	17 45 14.5	7.175	3	9 21 22.49	1.9733	10 36 15.6	10.470
4	7 47 20.84	2.0351	17 38 1.5	7.257	4	9 23 20.87	1.9726	10 25 45.7	10.523
5	7 49 22.90	2.0334	17 30 43.6	7.338	5	9 25 19.21	1.9721	10 15 12.7	10.576
6	7 51 24.85	2.0318	17 23 20.8	7.419	6	9 27 17.52	1.9715	10 4 36.6	10.627
7	7 53 26.71	2.0301	17 15 53.2	7.500	7	9 29 15.79	1.9708	9 53 57.4	10.678
8	7 55 28.47	2.0285	17 8 20.8	7.580	8	9 31 14.02	1.9700	9 43 15.2	10.728
9	7 57 30.13	2.0269	17 0 43.6	7.660	9	9 33 12.20	1.9694	9 32 30.0	10.778
10	7 59 31.69	2.0253	16 53 1.6	7.740	10	9 35 10.35	1.9689	9 21 41.8	10.828
11	8 1 33.16	2.0236	16 45 14.9	7.819	11	9 37 8.47	1.9685	9 10 50.6	10.878
12	8 3 34.53	2.0220	16 37 23.5	7.896	12	9 39 6.57	1.9680	8 59 56.3	10.928
13	8 5 35.80	2.0204	16 29 27.5	7.973	13	9 41 4.64	1.9676	8 48 59.1	10.976
14	8 7 36.97	2.0188	16 21 26.9	8.048	14	9 43 2.69	1.9672	8 37 59.1	11.023
15	8 9 38.05	2.0172	16 13 21.7	8.124	15	9 45 0.71	1.9668	8 26 56.4	11.068
16	8 11 39.03	2.0156	16 5 12.0	8.200	16	9 46 58.71	1.9666	8 15 51.0	11.118
17	8 13 39.92	2.0141	15 56 57.8	8.275	17	9 48 56.70	1.9664	8 4 42.8	11.167
18	8 15 40.72	2.0126	15 48 39.0	8.349	18	9 50 54.68	1.9661	7 53 32.0	11.200
19	8 17 41.43	2.0110	15 40 15.8	8.423	19	9 52 52.64	1.9659	7 42 18.7	11.240
20	8 19 42.05	2.0095	15 31 48.2	8.496	20	9 54 50.59	1.9656	7 31 3.2	11.277
21	8 21 42.57	2.0080	15 23 16.2	8.569	21	9 56 48.52	1.9655	7 19 45.4	11.314
22	8 23 43.00	2.0066	15 14 39.9	8.641	22	9 58 46.45	1.9655	7 8 25.4	11.351
23	8 25 43.35	2.0051	N.15° 5' 59.3"	8.712	23	10 0 44.38	1.9654	N. 6° 57' 3.3"	11.380
MONDAY 2.					WEDNESDAY 4.				
0	8 27 43.62	2.0037	N.14° 57' 14.4"	8.788	0	10 2 42.30	1.9655	N. 6° 45' 38.8"	11.430
1	8 29 43.80	2.0022	14 48 25.3	8.863	1	10 4 40.23	1.9656	6 34 11.7	11.473
2	8 31 43.89	2.0007	14 39 32.0	8.938	2	10 6 38.17	1.9657	6 22 42.1	11.512
3	8 33 43.89	1.9993	14 30 34.4	9.003	3	10 8 36.11	1.9656	6 11 10.3	11.548
4	8 35 43.81	1.9980	14 21 32.6	9.068	4	10 10 34.06	1.9659	5 59 36.3	11.584
5	8 37 43.65	1.9967	14 12 26.8	9.131	5	10 12 32.02	1.9660	5 48 0.2	11.619
6	8 39 43.41	1.9953	14 3 17.0	9.196	6	10 14 29.98	1.9662	5 36 22.0	11.652
7	8 41 43.09	1.9940	13 54 3.1	9.264	7	10 16 27.96	1.9665	5 24 41.9	11.685
8	8 43 42.70	1.9927	13 44 45.2	9.331	8	10 18 25.96	1.9668	5 12 59.8	11.717
9	8 45 42.23	1.9915	13 35 23.4	9.397	9	10 20 23.98	1.9672	5 1 15.8	11.749
10	8 47 41.68	1.9908	13 25 57.6	9.462	10	10 22 22.02	1.9676	4 49 29.9	11.779
11	8 49 41.06	1.9899	13 16 27.9	9.527	11	10 24 20.09	1.9680	4 37 42.3	11.808
12	8 51 40.38	1.9890	13 6 54.4	9.591	12	10 26 18.19	1.9685	4 25 52.8	11.837
13	8 53 39.62	1.9886	12 57 17.1	9.654	13	10 28 16.32	1.9691	4 14 1.7	11.866
14	8 55 38.79	1.9887	12 47 36.0	9.716	14	10 30 14.49	1.9698	4 2 9.0	11.896
15	8 57 37.90	1.9885	12 37 51.1	9.778	15	10 32 12.70	1.9704	3 50 14.5	11.922
16	8 59 36.93	1.9883	12 28 2.5	9.839	16	10 34 10.94	1.9710	3 38 18.5	11.947
17	9 1 35.90	1.9882	12 18 10.3	9.900	17	10 36 9.22	1.9717	3 26 21.1	11.970
18	9 3 34.82	1.9813	12 8 14.5	9.960	18	10 38 7.55	1.9724	3 14 22.2	11.993
19	9 5 33.67	1.9803	11 58 15.1	10.020	19	10 40 5.92	1.9733	3 2 21.9	12.015
20	9 7 32.46	1.9793	11 48 12.2	10.079	20	10 42 4.34	1.9741	2 50 20.3	12.037
21	9 9 31.19	1.9783	11 38 5.7	10.137	21	10 44 2.82	1.9750	2 38 17.3	12.059
22	9 11 29.86	1.9774	11 27 55.7	10.194	22	10 46 1.35	1.9760	2 26 13.2	12.080
23	9 13 28.48	1.9766	11 17 42.3	10.251	23	10 47 59.94	1.9770	2 14 7.8	12.101
24	9 15 27.06	1.9759	N.11° 7' 25.6"	10.306	24	10 49 58.60	1.9781	N. 2° 2' 1.2"	12.121

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 5.					SATURDAY 7.				
0	10 49 58.60	1.9781	N. 2 2 1.2	12.121	0	12 27 1.20	2.0697	S. 7 42 53.4	11.971
1	10 51 57.32	1.9793	1 49 53.3	12.139	1	12 29 6.32	2.0670	7 54 50.7	11.938
2	10 53 56.11	1.9804	1 37 44.5	12.154	2	12 31 11.64	2.0604	8 6 40.0	11.895
3	10 55 54.97	1.9815	1 25 34.9	12.167	3	12 33 17.17	2.0589	8 18 27.3	11.772
4	10 57 53.89	1.9827	1 13 24.5	12.180	4	12 35 22.91	2.0674	8 30 12.7	11.739
5	10 59 52.89	1.9839	1 1 13.2	12.195	5	12 37 28.86	2.1010	8 41 56.0	11.706
6	11 1 51.97	1.9853	0 49 1.0	12.210	6	12 39 35.02	2.1045	8 53 37.2	11.669
7	11 3 51.13	1.9867	0 36 47.9	12.224	7	12 41 41.40	2.1081	9 5 16.2	11.632
8	11 5 50.37	1.9880	0 24 34.1	12.236	8	12 43 48.00	2.1118	9 16 52.9	11.598
9	11 7 49.69	1.9894	0 12 19.6	12.247	9	12 45 54.82	2.1156	9 28 27.2	11.561
10	11 9 49.10	1.9910	N. 0 0 4.5	12.257	10	12 48 1.87	2.1194	9 39 59.0	11.510
11	11 11 48.60	1.9925	S. 0 12 11.2	12.268	11	12 50 9.15	2.1232	9 51 28.2	11.467
12	11 13 48.20	1.9941	0 24 27.3	12.271	12	12 52 16.65	2.1270	10 2 54.9	11.424
13	11 15 47.90	1.9958	0 36 43.7	12.277	13	12 54 24.38	2.1308	10 14 19.0	11.378
14	11 17 47.70	1.9975	0 49 0.5	12.283	14	12 56 32.35	2.1346	10 25 40.3	11.331
15	11 19 47.60	1.9991	1 1 17.7	12.288	15	12 58 40.56	2.1388	10 36 58.8	11.286
16	11 21 47.60	2.0009	1 13 35.2	12.291	16	13 0 49.00	2.1427	10 48 14.5	11.237
17	11 23 47.71	2.0027	1 25 52.8	12.293	17	13 2 57.68	2.1467	10 59 27.2	11.188
18	11 25 47.94	2.0047	1 38 10.4	12.294	18	13 5 6.59	2.1506	11 10 37.0	11.138
19	11 27 48.28	2.0067	1 50 28.1	12.296	19	13 7 15.74	2.1546	11 21 43.7	11.086
20	11 29 48.74	2.0087	2 2 45.9	12.296	20	13 9 25.14	2.1588	11 32 47.2	11.033
21	11 31 49.32	2.0107	2 15 3.6	12.296	21	13 11 34.80	2.1630	11 43 47.6	10.979
22	11 33 50.02	2.0128	2 27 21.3	12.293	22	13 13 44.71	2.1673	11 54 44.7	10.923
23	11 35 50.85	2.0149	S. 2 39 38.8	12.290	23	13 15 54.87	2.1714	S. 12 5 38.4	10.866
FRIDAY 6.					SUNDAY 8.				
0	11 37 51.81	2.0179	S. 2 51 56.0	12.286	0	13 18 5.27	2.1756	S. 12 16 28.7	10.807
1	11 39 52.91	2.0194	3 4 12.9	12.279	1	13 20 15.93	2.1798	12 27 15.4	10.748
2	11 41 54.14	2.0216	3 16 29.4	12.272	2	13 22 26.85	2.1841	12 37 58.4	10.688
3	11 43 55.51	2.0240	3 28 45.5	12.264	3	13 24 38.03	2.1885	12 48 37.8	10.626
4	11 45 57.02	2.0264	3 41 1.1	12.257	4	13 26 49.47	2.1929	12 59 13.5	10.564
5	11 47 58.67	2.0288	3 53 16.2	12.248	5	13 29 1.17	2.1972	13 9 45.4	10.500
6	11 50 0.47	2.0312	4 5 30.8	12.238	6	13 31 13.13	2.2015	13 20 13.4	10.434
7	11 52 2.42	2.0337	4 17 44.7	12.226	7	13 33 25.35	2.2058	13 30 37.4	10.368
8	11 54 4.52	2.0363	4 29 57.9	12.214	8	13 35 37.83	2.2102	13 40 57.4	10.302
9	11 56 6.78	2.0390	4 42 10.3	12.200	9	13 37 50.58	2.2146	13 51 13.5	10.233
10	11 58 9.20	2.0416	4 54 21.9	12.186	10	13 40 3.59	2.2190	14 1 25.4	10.163
11	12 0 11.78	2.0443	5 6 32.6	12.171	11	13 42 16.87	2.2235	14 11 33.0	10.092
12	12 2 14.51	2.0470	5 18 42.3	12.153	12	13 44 30.41	2.2280	14 21 36.3	10.019
13	12 4 17.41	2.0498	5 30 50.9	12.133	13	13 46 44.23	2.2326	14 31 35.1	9.943
14	12 6 20.49	2.0528	5 42 58.3	12.113	14	13 48 58.33	2.2373	14 41 29.4	9.867
15	12 8 23.75	2.0557	5 55 4.5	12.093	15	13 51 12.70	2.2419	14 51 19.1	9.791
16	12 10 27.18	2.0586	6 7 9.5	12.073	16	13 53 27.35	2.2465	15 1 4.3	9.715
17	12 12 30.79	2.0616	6 19 13.3	12.053	17	13 55 42.28	2.2511	15 10 44.9	9.637
18	12 14 34.57	2.0646	6 31 15.9	12.032	18	13 57 57.48	2.2557	15 20 20.8	9.557
19	12 16 38.53	2.0676	6 43 17.1	12.008	19	14 0 12.96	2.2603	15 29 51.8	9.476
20	12 18 42.68	2.0707	6 55 16.8	11.983	20	14 2 28.72	2.2649	15 39 17.9	9.396
21	12 20 47.03	2.0739	7 7 14.9	11.956	21	14 4 44.75	2.2695	15 48 39.2	9.313
22	12 22 51.56	2.0771	7 19 11.4	11.928	22	14 7 1.06	2.2743	15 57 55.5	9.228
23	12 24 56.28	2.0803	7 31 6.2	11.900	23	14 9 17.66	2.2791	16 7 6.7	9.142
24	12 27 1.20	2.0837	S. 7 42 59.4	11.871	24	14 11 34.55	2.2839	S. 16 16 12.6	9.056

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 9.					WEDNESDAY 11.				
0	14 11 34.55	2.2889	S. 16° 16' 12.6"	9.086	0	16 6 20.10	2.4848	S. 21° 29' 10.2"	2.080
1	14 13 51.72	2.2886	16 25 13.2	8.906	1	16 8 49.27	2.4877	21 32 41.3	2.482
2	14 16 9.17	2.2892	16 34 8.4	8.877	2	16 11 18.61	2.4906	21 36 4.2	2.314
3	14 18 26.90	2.2879	16 42 58.3	8.787	3	16 13 48.13	2.4984	21 39 18.9	2.176
4	14 20 44.91	2.2926	16 51 42.8	8.696	4	16 16 17.82	2.4999	21 42 25.3	2.086
5	14 23 3.21	2.2973	17 0 21.8	8.604	5	16 18 47.68	2.4990	21 45 23.3	2.896
6	14 25 21.79	2.3120	17 8 55.2	8.511	6	16 21 17.70	2.5016	21 48 12.8	2.787
7	14 27 40.65	2.3167	17 17 23.0	8.418	7	16 23 47.88	2.5041	21 50 54.0	2.617
8	14 29 59.79	2.3214	17 25 45.0	8.319	8	16 26 18.21	2.5066	21 53 26.8	2.478
9	14 32 19.22	2.3261	17 34 1.1	8.221	9	16 28 48.68	2.5091	21 55 51.3	2.338
10	14 34 38.93	2.3306	17 42 11.4	8.123	10	16 31 19.30	2.5114	21 58 7.3	2.196
11	14 36 58.91	2.3354	17 50 15.7	8.023	11	16 33 50.05	2.5136	22 0 14.6	2.040
12	14 39 19.17	2.3400	17 58 14.1	7.923	12	16 36 20.93	2.5167	22 2 13.2	1.906
13	14 41 39.71	2.3446	18 6 6.4	7.820	13	16 38 51.94	2.5177	22 4 3.3	1.768
14	14 44 0.53	2.3498	18 13 52.4	7.716	14	16 41 23.06	2.5196	22 5 44.8	1.630
15	14 46 21.63	2.3539	18 21 32.0	7.609	15	16 43 54.29	2.5214	22 7 17.7	1.476
16	14 48 43.00	2.3586	18 29 5.4	7.504	16	16 46 25.63	2.5231	22 8 41.9	1.380
17	14 51 4.65	2.3631	18 36 32.5	7.398	17	16 48 57.07	2.5248	22 9 57.3	1.163
18	14 53 26.57	2.3677	18 43 53.2	7.290	18	16 51 28.61	2.5265	22 11 3.8	1.087
19	14 55 48.77	2.3722	18 51 7.4	7.182	19	16 54 0.25	2.5281	22 12 1.6	0.981
20	14 58 11.23	2.3768	18 58 15.0	7.073	20	16 56 31.99	2.5297	22 12 50.7	0.746
21	15 0 33.96	2.3810	19 5 16.0	6.962	21	16 59 3.82	2.5311	22 13 31.1	0.609
22	15 2 56.95	2.3854	19 12 10.3	6.849	22	17 1 35.72	2.5323	22 14 2.6	0.482
23	15 5 20.20	2.3898	S. 19° 18' 57.8"	6.735	23	17 4 7.69	2.5334	S. 22° 14' 25.3"	0.304
TUESDAY 10.					THURSDAY 12.				
0	15 7 43.72	2.3943	S. 19° 25' 38.4"	6.620	0	17 6 39.73	2.5345	S. 22° 14' 39.1"	0.186
1	15 10 7.50	2.3984	19 32 12.1	6.504	1	17 9 11.82	2.5353	22 14 44.1	0.011
2	15 12 31.53	2.4026	19 38 38.8	6.388	2	17 11 43.96	2.5361	22 14 40.3	0.187
3	15 14 55.81	2.4068	19 44 58.6	6.271	3	17 14 16.15	2.5369	22 14 27.6	0.365
4	15 17 20.34	2.4110	19 51 11.3	6.152	4	17 16 48.38	2.5376	22 14 6.1	0.433
5	15 19 45.13	2.4152	19 57 16.8	6.031	5	17 19 20.65	2.5380	22 13 35.7	0.691
6	15 22 10.17	2.4193	20 3 15.0	5.910	6	17 21 52.95	2.5385	22 12 56.4	0.730
7	15 24 35.46	2.4234	20 9 6.0	5.790	7	17 24 25.28	2.5390	22 12 8.3	0.676
8	15 27 0.99	2.4275	20 14 49.8	5.670	8	17 26 57.63	2.5392	22 11 11.3	1.024
9	15 29 26.76	2.4316	20 20 26.4	5.548	9	17 29 29.99	2.5394	22 10 5.5	1.171
10	15 31 52.77	2.4354	20 25 55.5	5.423	10	17 32 2.36	2.5396	22 8 50.8	1.318
11	15 34 19.01	2.4393	20 31 17.0	5.296	11	17 34 34.74	2.5397	22 7 27.2	1.466
12	15 36 45.48	2.4432	20 36 30.8	5.168	12	17 37 7.13	2.5398	22 5 54.8	1.614
13	15 39 12.18	2.4470	20 41 37.1	5.041	13	17 39 39.51	2.5397	22 4 13.6	1.761
14	15 41 39.11	2.4507	20 46 35.7	4.913	14	17 42 11.87	2.5396	22 2 23.5	1.906
15	15 44 6.26	2.4544	20 51 26.6	4.783	15	17 44 44.20	2.5395	22 0 24.5	2.057
16	15 46 33.64	2.4581	20 56 9.7	4.653	16	17 47 16.51	2.5393	21 58 16.7	2.204
17	15 49 1.23	2.4617	21 0 45.0	4.523	17	17 49 48.79	2.5377	21 56 0.1	2.361
18	15 51 29.04	2.4652	21 5 12.5	4.393	18	17 52 21.04	2.5370	21 53 34.6	2.498
19	15 53 57.06	2.4687	21 9 32.1	4.262	19	17 54 53.24	2.5362	21 51 0.3	2.645
20	15 56 25.27	2.4720	21 13 43.8	4.130	20	17 57 25.38	2.5352	21 48 17.3	2.791
21	15 58 53.68	2.4758	21 17 47.5	3.996	21	17 59 57.46	2.5343	21 45 25.5	2.938
22	16 1 22.29	2.4786	21 21 43.2	3.860	22	18 2 29.48	2.5333	21 42 25.0	3.080
23	16 3 51.10	2.4817	21 25 30.8	3.726	23	18 5 1.44	2.5323	21 39 15.9	3.224
24	16 6 20.10	2.4848	S. 21° 29' 10.2"	3.589	24	18 7 33.34	2.5311	S. 21° 35' 58.1"	3.369

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 13.					SUNDAY 15.				
0	18 7 33.34	2.5311	S. 21° 35' 58.1"	3.369	0	20 6 19.00	2.3970	S. 16° 20' 16.2"	9.425
1	18 10 5.18	2.5301	21 32 31.6	3.514	1	20 8 42.71	2.3932	16 10 47.1	9.536
2	18 12 36.95	2.5289	21 28 56.4	3.668	2	20 11 6.19	2.3883	16 1 12.0	9.636
3	18 15 8.64	2.5275	21 25 12.7	3.800	3	20 13 29.43	2.3825	15 51 30.9	9.734
4	18 17 40.24	2.5258	21 21 20.5	3.943	4	20 15 52.45	2.3817	15 41 43.9	9.832
5	18 20 11.73	2.5240	21 17 19.7	4.085	5	20 18 15.24	2.3779	15 31 51.1	9.928
6	18 22 43.11	2.5223	21 13 10.3	4.228	6	20 20 37.80	2.3743	15 21 52.4	10.023
7	18 25 14.39	2.5204	21 8 52.3	4.371	7	20 23 0.14	2.3704	15 11 48.0	10.117
8	18 27 45.56	2.5188	21 4 25.8	4.513	8	20 25 22.25	2.3665	15 1 38.2	10.209
9	18 30 16.62	2.5169	20 59 50.9	4.653	9	20 27 44.12	2.3627	14 51 23.0	10.299
10	18 32 47.55	2.5144	20 55 7.6	4.791	10	20 30 5.77	2.3589	14 41 2.4	10.388
11	18 35 18.34	2.5123	20 50 16.0	4.929	11	20 32 27.19	2.3552	14 30 36.4	10.476
12	18 37 49.00	2.5101	20 45 16.1	5.067	12	20 34 48.39	2.3514	14 20 5.1	10.563
13	18 40 19.54	2.5079	20 40 8.0	5.203	13	20 37 9.36	2.3476	14 9 28.7	10.648
14	18 42 49.95	2.5057	20 34 51.8	5.339	14	20 39 30.10	2.3437	13 58 47.3	10.732
15	18 45 20.23	2.5034	20 29 27.4	5.475	15	20 41 50.60	2.3399	13 48 1.0	10.814
16	18 47 50.36	2.5010	20 23 54.8	5.611	16	20 44 10.88	2.3361	13 37 9.7	10.896
17	18 50 20.35	2.4986	20 18 14.0	5.747	17	20 46 30.93	2.3324	13 26 13.5	10.977
18	18 52 50.20	2.4961	20 12 25.0	5.883	18	20 48 50.76	2.3286	13 15 12.4	11.056
19	18 55 19.80	2.4935	20 6 28.0	6.016	19	20 51 10.36	2.3248	13 4 6.7	11.133
20	18 57 49.42	2.4907	20 0 23.2	6.147	20	20 53 29.74	2.3211	12 52 56.5	11.207
21	19 0 18.78	2.4879	19 54 10.6	6.277	21	20 55 48.80	2.3174	12 41 41.9	11.281
22	19 2 47.97	2.4851	19 47 50.1	6.407	22	20 58 7.82	2.3137	12 30 22.9	11.354
23	19 5 16.99	2.4823	S. 19 41 21.8	6.536	23	21 0 26.53	2.3099	S. 12 18 59.5	11.426
SATURDAY 14.					MONDAY 16.				
0	19 7 45.84	2.4796	S. 19 34 45.7	6.664	0	21 2 45.01	2.3063	S. 12 7 31.8	11.497
1	19 10 14.52	2.4769	19 28 2.0	6.791	1	21 5 3.27	2.3026	11 55 59.9	11.567
2	19 12 43.01	2.4736	19 21 10.8	6.917	2	21 7 21.33	2.2992	11 44 24.1	11.636
3	19 15 11.31	2.4703	19 14 12.0	7.043	3	21 9 39.18	2.2956	11 32 43.9	11.702
4	19 17 39.43	2.4671	19 7 5.6	7.169	4	21 11 56.80	2.2920	11 20 59.8	11.767
5	19 20 7.36	2.4639	18 59 51.7	7.294	5	21 14 14.21	2.2884	11 9 11.9	11.829
6	19 22 35.10	2.4607	18 52 30.3	7.417	6	21 16 31.40	2.2848	10 57 20.4	11.888
7	19 25 2.65	2.4574	18 45 1.6	7.539	7	21 18 48.38	2.2813	10 45 25.4	11.947
8	19 27 30.00	2.4541	18 37 25.7	7.658	8	21 21 5.16	2.2779	10 33 26.8	12.006
9	19 29 57.15	2.4508	18 29 42.6	7.778	9	21 23 21.73	2.2744	10 21 24.7	12.064
10	19 32 24.10	2.4473	18 21 52.3	7.897	10	21 25 38.09	2.2709	10 9 19.1	12.120
11	19 34 50.84	2.4438	18 13 54.9	8.014	11	21 27 54.24	2.2674	9 57 10.3	12.174
12	19 37 17.36	2.4404	18 5 50.5	8.130	12	21 30 10.18	2.2640	9 44 58.3	12.226
13	19 39 43.68	2.4370	17 57 39.2	8.245	13	21 32 25.92	2.2606	9 32 43.2	12.278
14	19 42 9.80	2.4336	17 49 21.1	8.359	14	21 34 41.46	2.2574	9 20 25.0	12.329
15	19 44 35.71	2.4300	17 40 56.2	8.471	15	21 36 56.81	2.2543	9 8 3.8	12.378
16	19 47 1.40	2.4263	17 32 24.5	8.583	16	21 39 11.97	2.2509	8 55 39.7	12.426
17	19 49 26.87	2.4226	17 23 46.1	8.696	17	21 41 26.93	2.2477	8 43 12.8	12.473
18	19 51 52.12	2.4190	17 15 1.0	8.806	18	21 43 41.60	2.2446	8 30 43.1	12.517
19	19 54 17.15	2.4154	17 6 9.4	8.914	19	21 45 56.27	2.2415	8 18 10.8	12.559
20	19 56 41.97	2.4118	16 57 11.4	9.021	20	21 48 10.67	2.2384	8 5 36.0	12.601
21	19 59 6.57	2.4081	16 48 7.0	9.126	21	21 50 24.88	2.2353	7 52 58.7	12.643
22	20 1 30.93	2.4044	16 38 56.3	9.230	22	21 52 38.90	2.2322	7 40 19.0	12.681
23	20 3 55.07	2.4007	16 29 39.3	9.333	23	21 54 52.74	2.2291	7 27 37.0	12.719
24	20 6 19.00	2.3970	S. 16 20 16.2	9.435	24	21 57 6.40	2.2263	S. 7 14 52.7	12.746

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 17.					THURSDAY 19.				
0	^h 21 ^m 57 ^s 6.40	2.2268	S. 7° 14' 52.7	12.766	0	^h 23 ^m 41 ^s 22.03	2.1846	N. 3° 12' 49.1	12.864
1	21 59 19.89	2.2286	7 2 6.2	12.791	1	23 43 30.08	2.1837	3 25 41.8	12.863
2	22 1 33.22	2.2307	6 49 17.7	12.824	2	23 45 38.08	2.1830	3 38 32.7	12.833
3	22 3 46.38	2.2179	6 36 27.3	12.855	3	23 47 46.04	2.1822	3 51 21.8	12.804
4	22 5 59.37	2.2161	6 23 35.0	12.886	4	23 49 53.95	2.1816	4 4 9.1	12.778
5	22 8 12.19	2.2123	6 10 41.0	12.914	5	23 52 1.82	2.1809	4 16 54.5	12.740
6	22 10 24.84	2.2095	5 57 45.3	12.941	6	23 54 9.66	2.1803	4 29 37.9	12.706
7	22 12 37.32	2.2068	5 44 48.0	12.967	7	23 56 17.46	2.1296	4 42 19.2	12.671
8	22 14 49.65	2.2042	5 31 49.2	12.992	8	23 58 25.22	2.1290	4 54 58.3	12.633
9	22 17 1.83	2.2016	5 18 48.9	13.016	9	0 0 32.94	2.1284	5 7 35.1	12.605
10	22 19 13.85	2.1990	5 5 47.2	13.039	10	0 2 40.63	2.1279	5 20 9.7	12.577
11	22 21 25.71	2.1964	4 52 44.2	13.060	11	0 4 48.30	2.1276	5 32 41.9	12.517
12	22 23 37.41	2.1939	4 39 40.0	13.079	12	0 6 55.94	2.1272	5 45 11.7	12.476
13	22 25 48.97	2.1916	4 26 34.8	13.096	13	0 9 3.56	2.1269	5 57 39.0	12.433
14	22 28 0.39	2.1891	4 13 28.6	13.112	14	0 11 11.16	2.1266	6 10 3.7	12.391
15	22 30 11.68	2.1866	4 0 21.4	13.127	15	0 13 18.74	2.1262	6 22 25.9	12.347
16	22 32 22.83	2.1846	3 47 13.3	13.143	16	0 15 26.30	2.1259	6 34 45.4	12.303
17	22 34 33.84	2.1823	3 34 4.3	13.156	17	0 17 33.85	2.1256	6 47 2.1	12.256
18	22 36 44.71	2.1801	3 20 54.6	13.167	18	0 19 41.38	2.1254	6 59 16.0	12.207
19	22 38 55.45	2.1779	3 7 44.3	13.176	19	0 21 48.90	2.1253	7 11 27.0	12.160
20	22 41 6.06	2.1756	2 54 33.5	13.184	20	0 23 56.42	2.1252	7 23 35.1	12.110
21	22 43 16.55	2.1737	2 41 22.3	13.190	21	0 26 3.93	2.1251	7 35 40.2	12.060
22	22 45 26.91	2.1717	2 28 10.7	13.196	22	0 28 11.43	2.1250	7 47 42.3	12.009
23	22 47 37.15	2.1697	S. 2° 14' 58.8	13.201	23	0 30 18.93	2.1250	N. 7° 59' 41.2	11.965
WEDNESDAY 18.					FRIDAY 20.				
0	22 49 47.27	2.1677	S. 2° 1 46.5	13.206	0	0 32 26.43	2.1250	N. 8° 11' 36.8	11.900
1	22 51 57.28	2.1659	1 48 34.1	13.206	1	0 34 33.93	2.1250	8 23 29.2	11.846
2	22 54 7.18	2.1642	1 35 21.8	13.204	2	0 36 41.43	2.1250	8 35 18.3	11.791
3	22 56 16.98	2.1624	1 22 9.6	13.202	3	0 38 48.93	2.1251	8 47 4.2	11.735
4	22 58 26.67	2.1606	1 8 57.5	13.200	4	0 40 56.44	2.1252	8 58 46.7	11.678
5	23 0 36.25	2.1588	0 55 45.5	13.198	5	0 43 3.96	2.1254	9 10 25.6	11.618
6	23 2 45.72	2.1571	0 42 33.7	13.196	6	0 45 11.49	2.1256	9 22 0.9	11.556
7	23 4 55.10	2.1555	0 29 22.2	13.193	7	0 47 19.03	2.1258	9 33 32.6	11.490
8	23 7 4.39	2.1540	0 16 11.1	13.189	8	0 49 26.58	2.1260	9 45 0.7	11.440
9	23 9 13.58	2.1524	S. 0° 3 0.5	13.172	9	0 51 34.15	2.1263	9 56 25.3	11.379
10	23 11 22.68	2.1506	N. 0° 10 9.5	13.162	10	0 53 41.74	2.1266	10 7 46.2	11.316
11	23 13 31.68	2.1486	0 23 18.9	13.152	11	0 55 49.35	2.1269	10 19 3.2	11.261
12	23 15 40.60	2.1469	0 36 27.6	13.140	12	0 57 56.97	2.1272	10 30 16.2	11.196
13	23 17 49.45	2.1469	0 49 35.5	13.126	13	1 0 4.61	2.1276	10 41 25.3	11.119
14	23 19 58.22	2.1456	1 2 42.5	13.109	14	1 2 12.28	2.1279	10 52 30.4	11.062
15	23 22 6.92	2.1442	1 15 48.5	13.092	15	1 4 19.97	2.1283	11 3 31.5	10.986
16	23 24 15.53	2.1429	1 28 53.5	13.076	16	1 6 27.68	2.1287	11 14 28.6	10.917
17	23 26 24.06	2.1416	1 41 57.5	13.057	17	1 8 35.42	2.1291	11 25 21.5	10.847
18	23 28 32.52	2.1406	1 55 0.4	13.036	18	1 10 43.19	2.1296	11 36 10.2	10.777
19	23 30 40.92	2.1396	2 8 2.0	13.017	19	1 12 50.98	2.1300	11 46 54.7	10.708
20	23 32 49.26	2.1386	2 21 2.3	12.994	20	1 14 58.80	2.1306	11 57 35.0	10.636
21	23 34 57.55	2.1376	2 34 1.2	12.970	21	1 17 6.66	2.1319	12 8 11.0	10.564
22	23 37 5.77	2.1365	2 46 58.7	12.946	22	1 19 14.55	2.1318	12 18 42.7	10.491
23	23 39 13.93	2.1356	2 59 54.7	12.921	23	1 21 22.47	2.1324	12 29 9.9	10.417
24	23 41 22.03	2.1346	N. 3° 12 49.1	12.894	24	1 23 30.43	2.1327	N. 12° 39 32.7	10.340

GREENWICH MEAN-TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 21.					MONDAY 23.				
0	1 ^h 23 ^m 30.43	2.1327	N.12° 39' 32.7"	10.340	0	3 ^h 6 ^m 40.73	2.1654	N.19° 16' 54.1"	6.002
1	1 25 38.41	2.1333	12 49 50.8	10.365	1	3 8 50.66	2.1659	19 22 51.2	5.900
2	1 27 46.43	2.1340	13 0 4.4	10.189	2	3 11 0.62	2.1663	19 28 42.1	5.798
3	1 29 54.50	2.1347	13 10 13.4	10.111	3	3 13 10.62	2.1668	19 34 26.9	5.696
4	1 32 2.60	2.1353	13 20 17.7	10.033	4	3 15 20.64	2.1673	19 40 5.5	5.593
5	1 34 10.74	2.1360	13 30 17.3	9.956	5	3 17 30.68	2.1678	19 45 37.9	5.489
6	1 36 18.91	2.1366	13 40 12.3	9.877	6	3 19 40.74	2.1679	19 51 4.2	5.386
7	1 38 27.12	2.1372	13 50 2.5	9.797	7	3 21 50.83	2.1683	19 56 24.2	5.281
8	1 40 35.37	2.1379	13 59 47.8	9.715	8	3 24 0.94	2.1686	20 1 37.9	5.177
9	1 42 43.67	2.1386	14 9 28.2	9.633	9	3 26 11.06	2.1689	20 6 45.4	5.073
10	1 44 52.01	2.1393	14 19 3.7	9.551	10	3 28 21.20	2.1691	20 11 46.6	4.968
11	1 47 0.39	2.1400	14 28 34.3	9.469	11	3 30 31.35	2.1693	20 16 41.5	4.863
12	1 49 8.81	2.1407	14 38 0.0	9.386	12	3 32 41.52	2.1696	20 21 30.0	4.756
13	1 51 17.28	2.1414	14 47 20.6	9.301	13	3 34 51.71	2.1699	20 26 12.2	4.652
14	1 53 25.79	2.1422	14 56 36.1	9.216	14	3 37 1.91	2.1700	20 30 48.2	4.548
15	1 55 34.35	2.1429	15 5 46.5	9.130	15	3 39 12.11	2.1701	20 35 17.9	4.443
16	1 57 42.95	2.1436	15 14 51.7	9.043	16	3 41 22.33	2.1702	20 39 41.2	4.338
17	1 59 51.59	2.1443	15 23 51.7	8.957	17	3 43 32.56	2.1703	20 43 58.2	4.230
18	2 2 0.27	2.1451	15 32 46.6	8.870	18	3 45 42.79	2.1705	20 48 8.8	4.123
19	2 4 9.00	2.1459	15 41 36.2	8.783	19	3 47 53.03	2.1706	20 52 13.0	4.016
20	2 6 17.78	2.1467	15 50 20.4	8.693	20	3 50 3.27	2.1707	20 56 10.8	3.910
21	2 8 26.60	2.1474	15 58 59.3	8.603	21	3 52 13.52	2.1707	21 0 2.2	3.804
22	2 10 35.46	2.1481	16 7 32.8	8.513	22	3 54 23.76	2.1707	21 3 47.3	3.698
23	2 12 44.36	2.1486	N.16 16 0.9	8.423	23	3 56 33.99	2.1708	N.21 7 26.0	3.593
SUNDAY 22.					TUESDAY 24.				
0	2 14 53.31	2.1496	N.16 24 23.6	8.333	0	3 58 44.22	2.1704	N.21 10 58.2	3.484
1	2 17 2.31	2.1504	16 32 40.8	8.241	1	4 0 54.44	2.1703	21 14 24.0	3.377
2	2 19 11.36	2.1512	16 40 52.5	8.149	2	4 3 4.65	2.1702	21 17 43.4	3.270
3	2 21 20.45	2.1519	16 48 58.6	8.056	3	4 5 14.86	2.1701	21 20 56.4	3.163
4	2 23 29.58	2.1526	16 56 59.1	7.962	4	4 7 25.06	2.1699	21 24 2.9	3.054
5	2 25 38.76	2.1534	17 4 54.0	7.868	5	4 9 35.25	2.1697	21 27 2.9	2.947
6	2 27 47.98	2.1541	17 12 43.3	7.774	6	4 11 45.43	2.1694	21 29 58.5	2.840
7	2 29 57.24	2.1548	17 20 26.9	7.680	7	4 13 55.59	2.1691	21 32 43.7	2.732
8	2 32 6.55	2.1556	17 28 4.8	7.584	8	4 16 5.73	2.1689	21 35 24.4	2.625
9	2 34 15.90	2.1561	17 35 37.0	7.488	9	4 18 15.86	2.1687	21 37 58.6	2.518
10	2 36 25.28	2.1567	17 43 3.4	7.392	10	4 20 25.97	2.1683	21 40 26.5	2.410
11	2 38 34.70	2.1574	17 50 24.0	7.297	11	4 22 36.05	2.1678	21 42 47.9	2.302
12	2 40 44.17	2.1581	17 57 38.9	7.200	12	4 24 46.10	2.1674	21 45 2.8	2.194
13	2 42 53.67	2.1586	18 4 48.0	7.101	13	4 26 56.13	2.1669	21 47 11.2	2.087
14	2 45 3.21	2.1593	18 11 51.1	7.001	14	4 29 6.13	2.1664	21 49 13.2	1.979
15	2 47 12.80	2.1600	18 18 48.1	6.903	15	4 31 16.10	2.1660	21 51 8.7	1.872
16	2 49 22.42	2.1606	18 25 39.3	6.806	16	4 33 26.04	2.1655	21 52 57.8	1.764
17	2 51 32.08	2.1613	18 32 24.7	6.707	17	4 35 35.95	2.1650	21 54 40.4	1.656
18	2 53 41.79	2.1620	18 39 4.2	6.607	18	4 37 45.82	2.1644	21 56 16.5	1.549
19	2 55 51.53	2.1626	18 45 37.6	6.507	19	4 39 55.66	2.1637	21 57 46.2	1.443
20	2 58 1.30	2.1632	18 52 5.0	6.406	20	4 42 5.46	2.1629	21 59 9.5	1.336
21	3 0 11.10	2.1638	18 58 26.4	6.305	21	4 44 15.21	2.1621	22 0 26.4	1.228
22	3 2 20.94	2.1644	19 4 41.7	6.204	22	4 46 24.91	2.1613	22 1 36.8	1.120
23	3 4 30.82	2.1650	19 10 50.9	6.103	23	4 48 34.56	2.1605	22 2 40.8	1.013
24	3 6 40.73	2.1654	N.19 16 54.1	6.002	24	4 50 44.17	2.1607	N.22 3 38.5	0.906

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 25.					FRIDAY 27.				
0	4 50 44.17	2.1597	N 22° 3' 38.5	0.906	0	6 32 57.30	2.0809	N 20° 47' 17.3	3.989
1	4 52 53.73	2.1599	22 4 29.7	0.799	1	6 35 2.69	2.0890	20 43 15.2	4.983
2	4 55 3.24	2.1591	22 5 14.5	0.692	2	6 37 7.97	2.0870	20 39 7.4	4.178
3	4 57 12.70	2.1573	22 5 52.8	0.586	3	6 39 13.13	2.0851	20 34 53.8	4.572
4	4 59 22.11	2.1563	22 6 24.8	0.479	4	6 41 18.17	2.0832	20 30 34.7	4.866
5	5 1 31.46	2.1553	22 6 50.4	0.373	5	6 43 23.10	2.0813	20 26 10.0	4.459
6	5 3 40.74	2.1543	22 7 9.5	0.266	6	6 45 27.92	2.0794	20 21 39.7	4.551
7	5 5 49.97	2.1533	22 7 22.3	0.160	7	6 47 32.63	2.0776	20 17 3.8	4.441
8	5 7 59.14	2.1522	22 7 28.7	0.054	8	6 49 37.22	2.0756	20 12 22.4	4.736
9	5 10 8.24	2.1511	22 7 28.8	0.062	9	6 51 41.69	2.0737	20 7 35.4	4.638
10	5 12 17.27	2.1500	22 7 22.5	0.158	10	6 53 46.05	2.0718	20 2 42.9	4.919
11	5 14 26.23	2.1489	22 7 9.9	0.263	11	6 55 50.30	2.0698	19 57 45.0	5.810
12	5 16 35.13	2.1478	22 6 51.1	0.368	12	6 57 54.43	2.0679	19 52 41.7	5.100
13	5 18 43.96	2.1466	22 6 25.9	0.473	13	6 59 58.44	2.0660	19 47 33.0	5.190
14	5 20 52.72	2.1453	22 5 54.4	0.578	14	7 2 2.34	2.0640	19 42 18.9	5.280
15	5 23 1.40	2.1441	22 5 16.6	0.682	15	7 4 6.12	2.0620	19 36 59.5	5.369
16	5 25 10.01	2.1428	22 4 32.5	0.787	16	7 6 9.78	2.0601	19 31 34.7	5.458
17	5 27 18.54	2.1416	22 3 42.1	0.892	17	7 8 13.33	2.0582	19 26 4.6	5.546
18	5 29 26.98	2.1402	22 2 45.5	0.996	18	7 10 16.76	2.0562	19 20 20.2	5.633
19	5 31 35.35	2.1388	22 1 42.6	1.100	19	7 12 20.07	2.0543	19 14 48.6	5.720
20	5 33 43.64	2.1374	22 0 33.5	1.204	20	7 14 23.27	2.0523	19 9 2.8	5.806
21	5 35 51.84	2.1360	21 59 18.2	1.307	21	7 16 26.35	2.0504	19 3 11.8	5.893
22	5 37 59.97	2.1346	21 57 56.7	1.410	22	7 18 29.31	2.0485	18 57 15.6	5.980
23	5 40 8.00	2.1331	N 21° 56' 29.0	1.514	23	7 20 32.16	2.0466	N 18° 51' 14.1	6.067
THURSDAY 26.					SATURDAY 28.				
0	5 42 15.93	2.1317	N 21° 54' 55.1	1.617	0	7 22 34.90	2.0447	N 18° 45' 7.4	6.153
1	5 44 23.79	2.1303	21 53 15.0	1.720	1	7 24 37.52	2.0428	18 38 55.7	6.237
2	5 46 31.56	2.1287	21 51 28.7	1.823	2	7 26 40.03	2.0409	18 32 39.0	6.321
3	5 48 39.23	2.1271	21 49 36.2	1.926	3	7 28 42.42	2.0390	18 26 17.3	6.404
4	5 50 46.81	2.1256	21 47 37.6	2.028	4	7 30 44.70	2.0370	18 19 50.6	6.487
5	5 52 54.30	2.1241	21 45 33.0	2.128	5	7 32 46.87	2.0352	18 13 18.9	6.570
6	5 55 1.70	2.1226	21 43 22.3	2.228	6	7 34 48.93	2.0334	18 6 42.1	6.653
7	5 57 9.00	2.1208	21 41 5.7	2.327	7	7 36 50.88	2.0316	18 0 0.4	6.735
8	5 59 16.20	2.1191	21 38 43.1	2.427	8	7 38 52.72	2.0297	17 53 13.9	6.816
9	6 1 23.30	2.1174	21 36 14.5	2.526	9	7 40 54.45	2.0279	17 46 22.6	6.896
10	6 3 30.30	2.1158	21 33 40.0	2.624	10	7 42 56.07	2.0261	17 39 26.4	6.976
11	6 5 37.20	2.1141	21 30 59.7	2.723	11	7 44 57.58	2.0244	17 32 25.4	7.057
12	6 7 44.00	2.1126	21 28 13.4	2.822	12	7 46 58.99	2.0226	17 25 19.5	7.137
13	6 9 50.70	2.1108	21 25 21.1	2.922	13	7 49 0.29	2.0207	17 18 9.0	7.217
14	6 11 57.29	2.1090	21 22 22.7	3.022	14	7 51 1.48	2.0189	17 10 53.7	7.296
15	6 14 3.78	2.1073	21 19 18.3	3.121	15	7 53 2.56	2.0171	17 3 33.6	7.374
16	6 16 10.16	2.1054	21 16 8.1	3.219	16	7 55 3.54	2.0156	16 56 8.9	7.451
17	6 18 16.43	2.1037	21 12 52.0	3.317	17	7 57 4.42	2.0138	16 48 39.6	7.528
18	6 20 22.60	2.1019	21 9 30.1	3.413	18	7 59 5.20	2.0121	16 41 5.6	7.604
19	6 22 28.06	2.1001	21 6 2.4	3.510	19	8 1 5.88	2.0105	16 33 27.1	7.681
20	6 24 34.61	2.0982	21 2 28.9	3.606	20	8 3 6.46	2.0088	16 25 44.0	7.756
21	6 26 40.44	2.0964	20 58 49.6	3.703	21	8 5 6.93	2.0071	16 17 56.4	7.830
22	6 28 46.17	2.0946	20 55 4.6	3.799	22	8 7 7.31	2.0055	16 10 4.3	7.904
23	6 30 51.79	2.0927	20 51 13.8	3.895	23	8 9 7.59	2.0040	16 2 7.7	7.979
24	6 32 57.30	2.0909	N 20° 47' 17.3	3.990	24	8 11 7.78	2.0024	N 15° 54' 6.6	8.055

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 29.					TUESDAY 31.				
0	8 11 7.78	2.0024	N.15 54 6.6	8.065	0	9 45 58.14	1.9924	N. 8 12 48.5	10.946
1	8 13 7.88	2.0009	15 46 1.1	8.198	1	9 47 55.89	1.9926	8 1 50.4	10.990
2	8 15 7.89	1.9994	15 37 51.3	8.201	2	9 49 53.65	1.9927	7 50 49.7	11.034
3	8 17 7.81	1.9980	15 29 37.1	8.272	3	9 51 51.41	1.9928	7 39 46.3	11.078
4	8 19 7.64	1.9964	15 21 18.6	8.343	4	9 53 49.18	1.9929	7 28 40.3	11.122
5	8 21 7.38	1.9947	15 12 55.9	8.414	5	9 55 46.96	1.9931	7 17 31.7	11.166
6	8 23 7.02	1.9933	15 4 28.9	8.485	6	9 57 44.76	1.9934	7 6 20.5	11.208
7	8 25 6.58	1.9920	14 55 57.7	8.555	7	9 59 42.57	1.9938	6 55 6.9	11.247
8	8 27 6.06	1.9907	14 47 22.3	8.625	8	10 1 40.41	1.9942	6 43 50.8	11.288
9	8 29 5.46	1.9894	14 38 42.7	8.695	9	10 3 38.27	1.9946	6 32 32.2	11.329
10	8 31 4.78	1.9880	14 29 59.0	8.764	10	10 5 36.16	1.9950	6 21 11.3	11.369
11	8 33 4.02	1.9866	14 21 11.2	8.832	11	10 7 34.08	1.9956	6 9 48.0	11.408
12	8 35 3.18	1.9853	14 12 19.2	8.900	12	10 9 32.03	1.9962	5 58 22.3	11.446
13	8 37 2.26	1.9841	14 3 23.2	8.966	13	10 11 30.03	1.9969	5 46 54.5	11.482
14	8 39 1.27	1.9830	13 54 23.3	9.032	14	10 13 28.07	1.9976	5 35 24.6	11.517
15	8 41 0.22	1.9818	13 45 19.4	9.097	15	10 15 26.14	1.9982	5 23 52.5	11.552
16	8 42 59.09	1.9806	13 36 11.6	9.162	16	10 17 24.26	1.9990	5 12 18.3	11.587
17	8 44 57.89	1.9799	13 26 59.9	9.227	17	10 19 22.43	1.9997	5 0 42.0	11.621
18	8 46 56.62	1.9783	13 17 44.3	9.292	18	10 21 20.64	1.9708	4 49 3.7	11.654
19	8 48 55.29	1.9773	13 8 24.9	9.356	19	10 23 18.91	1.9716	4 37 23.4	11.687
20	8 50 53.90	1.9763	12 59 1.6	9.420	20	10 25 17.24	1.9726	4 25 41.2	11.719
21	8 52 52.45	1.9753	12 49 34.5	9.483	21	10 27 15.62	1.9736	4 13 57.1	11.749
22	8 54 50.94	1.9743	12 40 3.6	9.544	22	10 29 14.06	1.9746	4 2 11.2	11.780
23	8 56 49.37	1.9733	N.12 30 29.1	9.606	23	10 31 12.57	1.9757	N. 3 50 23.5	11.810
MONDAY 30.					WEDNESDAY, APRIL 1.				
0	8 58 47.75	1.9726	N.12 20 51.0	9.666	0	10 33 11.15	1.9769	N. 3 38 34.1	11.838
1	9 0 46.08	1.9717	12 11 9.3	9.726	PHASES OF THE MOON.				
2	9 2 44.36	1.9709	12 1 24.0	9.785					
3	9 4 42.58	1.9701	11 51 35.0	9.844					
4	9 6 40.76	1.9694	11 41 42.5	9.903					
5	9 8 38.90	1.9686	11 31 46.6	9.961					
6	9 10 36.99	1.9679	11 21 47.2	10.018					
7	9 12 35.04	1.9673	11 11 44.4	10.076					
8	9 14 33.06	1.9667	11 1 38.2	10.131					
9	9 16 31.04	1.9660	10 51 28.7	10.187					
10	9 18 28.99	1.9656	10 41 15.8	10.243					
11	9 20 26.91	1.9651	10 30 59.6	10.297	☉ Full Moon, . . . 5 2 46.0 ☾ Last Quarter, . . 12 6 55.9 ● New Moon, . . 19 2 37.3 ☽ First Quarter, . . 26 20 57.6				
12	9 22 24.81	1.9647	10 20 40.2	10.349					
13	9 24 22.68	1.9643	10 10 17.7	10.401					
14	9 26 20.52	1.9639	9 59 52.0	10.454					
15	9 28 18.34	1.9635	9 49 23.1	10.506					
16	9 30 16.13	1.9631	9 38 51.1	10.557					
17	9 32 13.91	1.9626	9 28 16.1	10.608					
18	9 34 11.69	1.9627	9 17 38.1	10.658					
19	9 36 9.45	1.9626	9 6 57.1	10.708					
20	9 38 7.20	1.9623	8 56 13.2	10.756					
21	9 40 4.94	1.9623	8 45 26.3	10.805	☾ Perigee, 14 19.9 ☾ Apogee, 27 2.0				
22	9 42 2.67	1.9622	8 34 36.5	10.853					
23	9 44 0.40	1.9623	8 23 43.9	10.900					
24	9 45 58.14	1.9624	N. 8 12 48.5	10.946					

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	α Arietis W.	78° 34' 59"	3051	80° 4' 9"	3043	81° 33' 28"	3036	83° 2' 56"	3030
	Mars W.	58 23 1	3236	59 48 27	3230	61 14 1	3222	62 39 44	3214
	Aldebaran W.	45 33 35	3061	47 2 32	3052	48 31 40	3043	50 0 59	3034
	Regulus E.	34 35 35	3080	33 7 1	3078	31 38 25	3077	30 9 47	3076
	Saturn E.	70 29 43	3033	69 0 11	3027	67 30 32	3022	66 0 46	3014
	Spica E.	88 17 21	3019	86 47 32	3014	85 17 36	3007	83 47 32	3000
	Jupiter E.	93 22 50	3014	91 52 55	3008	90 22 52	3001	88 52 40	2993
2	α Arietis W.	90 32 31	2990	92 2 56	2981	93 33 32	2973	95 4 19	2964
	Mars W.	69 50 40	3173	71 17 21	3164	72 44 13	3155	74 11 16	3146
	Aldebaran W.	57 30 21	2989	59 0 48	2979	60 31 27	2969	62 2 19	2960
	Saturn E.	58 29 52	2981	56 59 15	2975	55 28 31	2968	53 57 38	2961
	Spica E.	76 14 50	2960	74 43 47	2951	73 12 33	2942	71 41 8	2934
	Jupiter E.	81 19 17	2954	79 48 6	2945	78 16 44	2937	76 45 12	2928
3	Mars W.	81 29 29	3096	82 57 44	3088	84 26 11	3078	85 54 51	3064
	Aldebaran W.	69 39 45	2909	71 11 53	2898	72 44 14	2888	74 16 48	2877
	Pollux W.	28 45 37	3163	30 12 30	3129	31 40 4	3098	33 8 16	3069
	Saturn E.	46 21 2	2928	44 49 19	2922	43 17 28	2915	41 45 28	2909
	Spica E.	64 1 9	2887	62 28 33	2876	60 55 44	2868	59 22 42	2867
	Jupiter E.	69 4 39	2883	67 31 58	2873	65 59 4	2862	64 25 54	2862
4	Mars W.	93 21 30	3011	94 51 29	3000	96 21 42	2989	97 52 8	2978
	Aldebaran W.	82 3 2	2826	83 36 58	2815	85 11 7	2804	86 45 30	2794
	Pollux W.	40 37 16	2954	42 8 27	2935	43 40 2	2916	45 12 0	2899
	Spica E.	51 34 20	2805	49 59 59	2796	48 25 26	2786	46 50 40	2775
	Jupiter E.	56 37 10	2805	55 2 48	2796	53 28 15	2787	51 53 30	2777
	Antares E.	97 4 20	2815	95 30 11	2805	93 55 49	2794	92 21 13	2784
5	Aldebaran W.	94 40 46	2743	96 16 29	2732	97 52 26	2722	99 28 36	2713
	Pollux W.	52 57 7	2821	54 31 8	2807	56 5 27	2794	57 40 3	2781
	Spica E.	38 53 29	2726	37 17 24	2716	35 41 6	2707	34 4 35	2697
	Jupiter E.	43 56 42	2733	42 20 46	2726	40 44 41	2719	39 8 26	2711
	Antares E.	84 24 52	2732	82 48 55	2722	81 12 45	2713	79 36 22	2703
6	Pollux W.	65 37 14	2719	67 13 28	2709	68 49 56	2698	70 26 39	2687
	Regulus W.	28 35 9	2721	30 11 21	2704	31 47 55	2689	33 24 50	2678
	Jupiter E.	31 4 59	2684	29 27 58	2668	27 50 55	2661	26 13 50	2652
	Antares E.	71 31 13	2655	69 53 33	2646	68 15 40	2638	66 37 36	2629
7	Pollux W.	78 33 43	2633	80 11 48	2628	81 50 5	2620	83 28 33	2612
	Regulus W.	41 33 58	2612	43 12 37	2601	44 51 31	2601	46 30 39	2600
	Antares E.	58 24 20	2597	56 45 7	2580	55 5 44	2572	53 26 10	2564
8	Regulus W.	54 39 45	2533	56 30 12	2525	58 10 50	2517	59 31 39	2509
	Saturn W.	20 19 8	2761	21 54 27	2717	23 30 44	2681	25 7 50	2647
	Antares E.	45 5 52	2531	43 25 22	2526	41 44 44	2520	40 3 58	2516
	α Aquilæ E.	98 6 9	2968	96 35 3	2946	95 3 43	2937	93 32 11	2928
9	Regulus W.	68 18 30	2472	70 0 23	2465	71 42 26	2456	73 24 39	2450
	Saturn W.	33 22 41	2637	35 3 3	2622	36 43 46	2607	38 24 50	2494
	α Aquilæ E.	85 52 5	2896	84 19 41	2892	82 47 12	2880	81 14 39	2867
10	Regulus W.	81 58 6	2419	83 41 14	2413	85 24 30	2407	87 7 55	2402
	Saturn W.	46 54 23	2440	48 37 1	2431	50 19 52	2422	52 2 56	2413

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	α Arietis W.	84° 32' 32"	3023	86° 2' 17"	3016	87° 32' 11"	3006	89° 2' 16"	2996
	Mars W.	64 5 37	3207	65 31 38	3190	66 57 48	3190	68 24 9	3182
	Aldebaran W.	51 30 29	3026	53 0 10	3017	54 30 2	3007	56 0 6	2996
	Regulus E.	28 41 8	3074	27 12 30	3079	25 43 55	3092	24 15 24	3087
	Saturn E.	64 30 51	3009	63 0 49	3002	61 30 30	2995	60 0 20	2988
	Spica E.	82 17 19	2992	80 46 56	2985	79 16 24	2977	77 45 42	2969
	Jupiter E.	87 22 19	2985	85 51 48	2978	84 21 8	2970	82 50 18	2962
2	α Arietis W.	96 35 17	2965	98 6 26	2946	99 37 46	2937	101 9 18	2927
	Mars W.	75 38 31	3136	77 5 57	3126	78 33 35	3115	80 1 26	3105
	Aldebaran W.	63 33 23	2950	65 4 39	2939	66 36 8	2929	68 7 50	2919
	Saturn E.	52 26 36	2954	50 55 25	2947	49 24 6	2940	47 52 38	2934
	Spica E.	70 9 32	2924	68 37 43	2915	67 5 43	2906	65 33 32	2897
	Jupiter E.	75 13 29	2919	73 41 34	2909	72 9 27	2901	70 37 9	2891
3	Mars W.	87 23 45	3064	88 52 51	3043	90 22 11	3032	91 51 44	3022
	Aldebaran W.	75 49 36	2967	77 22 37	2957	78 55 52	2946	80 29 20	2935
	Pollux W.	34 37 3	3043	36 6 23	3018	37 36 13	2996	39 6 31	2974
	Saturn E.	40 13 21	2905	38 41 9	2901	37 8 52	2899	35 36 32	2896
	Spica E.	57 49 28	2846	56 16 0	2836	54 42 19	2827	53 8 26	2817
	Jupiter E.	62 52 34	2843	61 19 2	2833	59 45 17	2824	58 11 20	2814
4	Mars W.	79 22 48	2968	100 53 41	2937	102 24 48	2946	103 56 8	2935
	Aldebaran W.	88 20 6	2784	89 54 55	2773	91 29 58	2703	93 5 15	2762
	Pollux W.	46 44 20	2882	48 17 2	2866	49 50 4	2851	51 23 26	2836
	Spica E.	45 15 40	2765	43 40 26	2756	42 5 0	2746	40 29 21	2736
	Jupiter E.	50 18 32	2767	48 43 21	2760	47 8 0	2750	45 32 27	2741
	Antares E.	90 46 24	2773	89 11 21	2763	87 36 5	2753	86 0 35	2743
5	Aldebara W.	101 4 58	2704	102 41 32	2695	104 18 19	2685	105 55 19	2675
	Pollux W.	59 14 56	2768	60 50 6	2755	62 25 33	2743	64 1 16	2732
	Spica E.	32 27 51	2688	30 50 55	2678	29 13 46	2669	27 36 25	2660
	Jupiter E.	37 32 1	2705	35 55 28	2698	34 18 46	2692	32 41 56	2687
	Antares E.	77 59 46	2693	76 22 57	2684	74 45 55	2674	73 8 40	2665
6	Pollux W.	72 3 37	2677	73 40 48	2666	75 18 13	2657	76 55 51	2646
	Regulus W.	35 2 4	2660	36 39 37	2648	38 17 27	2636	39 55 34	2623
	Jupiter E.	24 36 46	2696	22 59 47	2692	21 22 57	2702	19 46 20	2716
	Antares E.	64 59 20	2620	63 20 52	2612	61 42 13	2603	60 3 22	2596
7	Pollux W.	85 7 12	2603	86 46 3	2594	88 25 6	2586	90 4 20	2578
	Regulus W.	48 10 2	2569	49 49 39	2560	51 29 29	2551	53 9 31	2543
	Antares E.	51 46 25	2557	50 6 31	2550	48 26 27	2543	46 46 14	2537
8	Regulus W.	61 32 40	2601	63 13 52	2494	64 55 14	2486	66 36 47	2479
	Saturn W.	26 45 41	2618	28 24 11	2606	30 3 13	2574	31 42 43	2564
	Antares E.	38 23 5	2611	36 42 7	2606	35 1 2	2602	33 19 52	2499
	α Aquilæ E.	92 0 28	2620	90 28 34	2613	88 56 32	2607	87 24 22	2601
9	Regulus W.	75 7 3	2444	76 49 35	2438	78 32 16	2431	80 15 6	2424
	Saturn W.	40 6 12	2482	41 47 51	2470	43 29 46	2459	45 11 57	2448
	α Aquilæ E.	79 42 3	2685	78 9 29	2685	76 36 47	2686	75 4 10	2687
10	Regulus W.	88 51 27	2396	90 35 7	2390	92 18 56	2385	94 2 52	2379
	Saturn W.	53 46 12	2405	55 29 39	2396	57 13 17	2390	58 57 6	2383

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
10	Spica W.	27° 55' 50"	2408	29° 39' 13"	2401	31° 22' 46"	2385	33° 6' 28"	2389
	Jupiter W.	23 53 22	2464	25 35 26	2450	27 17 50	2436	29 0 33	2424
	α Aquilæ E.	73 31 34	2890	71 59 2	2894	70 26 35	2899	68 54 15	2905
	SUN E.	119 32 36	2748	117 57 0	2741	116 21 14	2734	114 45 19	2728
11	Saturn W.	60 41 5	2376	62 25 14	2370	64 9 32	2364	65 53 59	2357
	Spica W.	41 47 10	2369	43 31 43	2364	45 16 24	2348	47 1 13	2343
	Jupiter W.	37 38 15	2373	39 22 29	2364	41 6 56	2366	42 51 34	2348
	α Aquilæ E.	61 15 11	2960	59 44 8	2977	58 13 27	2997	56 43 10	3018
	SUN E.	106 43 38	2696	105 6 52	2690	103 29 59	2684	101 52 58	2679
12	Saturn W.	74 38 24	2329	76 23 41	2324	78 9 5	2320	79 54 36	2314
	Spica W.	55 47 10	2319	57 32 42	2313	59 18 22	2309	61 4 8	2304
	Jupiter W.	51 37 18	2316	53 22 54	2310	55 8 39	2304	56 54 32	2299
	α Aquilæ E.	49 19 41	3177	47 53 4	3222	46 27 21	3273	45 2 38	3329
	SUN E.	93 46 2	2665	92 8 17	2647	90 30 26	2642	88 52 28	2638
13	Saturn W.	88 43 53	2294	90 30 2	2290	92 16 16	2287	94 2 35	2283
	Spica W.	69 54 33	2285	71 40 55	2281	73 27 23	2277	75 13 56	2273
	Jupiter W.	65 45 51	2276	67 32 27	2271	69 19 9	2267	71 5 57	2263
	Antares W.	24 43 16	2350	26 28 3	2338	28 13 7	2328	29 58 26	2317
	SUN E.	80 41 7	2615	79 2 33	2612	77 23 55	2609	75 45 12	2605
14	Spica W.	84 7 51	2260	85 54 50	2258	87 41 52	2256	89 28 57	2253
	Jupiter W.	80 1 16	2247	81 48 33	2246	83 35 54	2243	85 23 18	2241
	Antares W.	38 47 48	2288	40 34 5	2283	42 20 29	2280	44 6 58	2277
	SUN E.	67 30 32	2692	65 51 26	2690	64 12 17	2688	62 33 5	2686
	α Arietis E.	108 55 3	2295	107 8 56	2291	105 22 44	2289	103 36 28	2286
15	Jupiter W.	94 20 54	2235	96 8 29	2235	97 56 4	2235	99 43 39	2236
	Antares W.	53 0 27	2266	54 47 17	2264	56 34 9	2264	58 21 2	2264
	SUN E.	54 16 48	2665	52 37 33	2665	50 58 18	2666	49 19 4	2666
	α Arietis E.	94 44 26	2290	92 57 57	2290	91 11 28	2279	89 24 58	2279
16	Antares W.	67 15 24	2268	69 2 11	2270	70 48 55	2272	72 35 36	2274
	SUN E.	41 3 44	2605	39 24 56	2610	37 46 14	2615	36 7 39	2622
	α Arietis E.	80 32 48	2287	78 46 30	2290	77 0 16	2294	75 14 7	2296
21	α Aquilæ W.	83 9 40	3065	84 38 33	3076	86 7 12	3089	87 35 35	3102
	SUN W.	23 52 45	3047	25 21 59	3055	26 51 4	3064	28 19 58	3073
	Mars E.	43 13 29	2825	41 39 33	2840	40 5 57	2855	38 32 41	2870
	Aldebaran E.	44 44 24	2661	43 6 52	2679	41 29 44	2696	39 52 59	2713
	Pollux E.	86 55 26	2667	85 18 29	2701	83 41 50	2715	82 5 30	2730
22	α Aquilæ W.	94 53 18	3177	96 19 55	3193	97 46 12	3211	99 12 8	3229
	SUN W.	35 41 31	3126	37 9 9	3138	38 36 32	3152	40 3 39	3165
	Mars E.	30 51 7	2946	29 19 46	2962	27 48 45	2977	26 18 3	2992
	Aldebaran E.	31 55 17	2611	30 21 3	2633	28 47 18	2656	27 14 2	2679
	Pollux E.	74 8 49	2605	72 34 28	2621	71 0 27	2637	69 26 47	2652
23	SUN W.	47 15 23	3228	48 40 59	3242	50 6 19	3253	51 31 25	3266
	Venus W.	22 52 51	3363	24 16 1	3363	25 39 0	3372	27 1 48	3381
	Pollux E.	61 43 24	2990	60 11 43	2946	58 40 22	2961	57 9 20	2976
	Regulus E.	98 18 37	2661	96 45 28	2673	95 12 35	2686	93 39 58	2698

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
10	Spica W.	34° 50' 19"	2362	36° 34' 19"	2376	38° 18' 28"	2371	40° 2' 45"	2365
	Jupiter W.	30 43 34	2412	32 26 51	2401	34 10 24	2390	35 54 13	2381
	α Aquilæ E.	67 22 2	2913	65 49 59	2923	64 18 9	2933	62 46 32	2946
	SUN E.	113 9 16	2722	111 33 5	2714	109 56 44	2708	108 20 15	2702
11	Saturn W.	67 38 35	2351	69 23 20	2346	71 8 13	2340	72 53 14	2334
	Spica W.	48 46 10	2338	50 31 14	2333	52 16 25	2328	54 1 44	2323
	Jupiter W.	44 36 23	2341	46 21 23	2334	48 6 33	2328	49 51 51	2322
	α Aquilæ E.	55 13 19	3041	53 43 57	3069	52 15 9	3103	50 47 3	3139
	SUN E.	100 15 50	2674	98 38 35	2667	97 1 11	2662	95 23 40	2657
12	Saturn W.	81 40 15	2310	83 26 0	2306	85 11 52	2301	86 57 50	2298
	Spica W.	62 50 1	2300	64 36 0	2296	66 22 5	2292	68 8 16	2288
	Jupiter W.	58 40 33	2294	60 26 42	2289	62 12 58	2284	63 59 21	2279
	α Aquilæ E.	43 39 0	3394	42 16 37	3406	40 55 37	3456	39 36 13	3461
	SUN E.	87 14 24	2632	85 36 13	2629	83 57 57	2624	82 19 35	2620
13	Saturn W.	95 48 59	2281	97 35 27	2278	99 21 59	2275	101 8 35	2273
	Spica W.	77 0 35	2271	78 47 17	2268	80 34 4	2265	82 20 55	2262
	Jupiter W.	72 52 51	2260	74 39 50	2256	76 26 54	2253	78 14 3	2250
	Antares W.	31 44 0	2311	33 29 44	2304	35 15 38	2298	37 1 40	2294
	SUN E.	74 6 24	2601	73 27 31	2599	71 48 35	2596	69 9 35	2594
14	Spica W.	91 16 6	2252	93 3 16	2251	94 50 28	2249	96 37 42	2249
	Jupiter W.	87 10 45	2239	88 58 15	2237	90 45 47	2237	92 33 20	2236
	Antares W.	45 53 32	2273	47 40 11	2271	49 26 53	2268	51 13 39	2267
	SUN E.	60 53 51	2585	59 14 36	2585	57 35 20	2585	55 56 4	2585
	α Arietis E.	101 50 8	2285	100 3 46	2283	98 17 21	2281	96 30 54	2281
15	Jupiter W.	101 31 14	2237	103 18 47	2237	105 6 19	2239	107 53 49	2241
	Antares W.	60 7 56	2264	61 54 49	2264	63 41 42	2264	65 28 34	2266
	SUN E.	47 39 52	2590	46 0 43	2593	44 21 39	2590	42 42 39	2590
	α Arietis E.	87 38 28	2281	85 52 0	2282	84 5 34	2283	82 19 10	2285
16	Antares W.	74 22 13	2278	76 8 45	2281	77 55 12	2286	79 41 32	2289
	SUN E.	34 29 14	2630	32 51 0	2638	31 12 56	2648	29 35 6	2660
	α Arietis E.	73 28 4	2302	71 42 7	2306	69 56 16	2311	68 10 32	2316
21	α Aquilæ W.	89 3 42	3115	90 31 33	3130	91 59 6	3145	93 26 21	3160
	SUN W.	29 48 42	3061	31 17 15	3092	32 45 34	3104	34 13 39	3114
	Mars E.	36 59 44	2885	35 27 6	2900	33 54 47	2915	32 22 47	2931
	Aldebaran E.	38 16 37	2732	36 40 40	2750	35 5 7	2769	33 29 59	2789
	Pollux E.	80 29 30	2744	78 53 49	2760	77 18 29	2775	75 43 29	2791
22	α Aquilæ W.	100 37 43	3247	102 2 56	3268	103 27 47	3285	104 52 16	3304
	SUN W.	41 30 30	3178	42 57 6	3190	44 23 27	3203	45 49 33	3216
	Mars E.	24 47 40	3007	23 17 36	3023	21 47 51	3038	20 18 25	3054
	Aldebaran E.	25 41 16	2907	24 9 6	2937	22 37 34	2968	21 6 41	3001
	Pollux E.	67 53 27	2868	66 20 27	2883	64 47 46	2898	63 15 25	2914
23	SUN W.	52 56 16	3278	54 20 53	3290	55 45 16	3302	57 9 25	3313
	Venus W.	28 24 26	3390	29 46 54	3400	31 9 11	3409	32 31 17	3419
	Pollux E.	55 38 37	2992	54 8 14	3008	52 38 11	3024	51 8 28	3040
	Regulus E.	92 7 37	2909	90 35 30	2922	89 3 39	2934	87 32 3	2945

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
24	SUN	W.	58° 33' 22"	3324	59° 57' 6"	3326	61° 20' 37"	3345	62° 43' 56"	3346
	Venus	W.	33 53 12	3437	35 14 58	3437	36 36 33	3446	37 57 58	3454
	α Arietis	W.	27 38 54	3067	29 7 19	3067	30 35 45	3083	32 4 13	3084
	Pollux	E.	49 39 5	3056	48 10 2	3073	46 41 19	3089	45 12 56	3106
	Regulus	E.	86 0 41	2956	84 29 32	2966	82 58 37	2977	81 27 55	2966
25	SUN	W.	69 37 49	3400	71 0 6	3408	72 22 14	3415	73 44 14	3421
	Venus	W.	44 42 41	3494	46 3 11	3602	47 23 33	3508	48 43 48	3516
	α Arietis	W.	39 26 30	3090	40 54 52	3093	42 23 10	3096	43 51 25	3099
	Pollux	E.	37 56 18	3198	36 30 7	3230	35 4 22	3242	33 39 3	3267
	Regulus	E.	73 57 18	3029	72 27 41	3038	70 58 15	3046	69 28 59	3052
26	SUN	W.	80 32 32	3447	81 53 55	3451	83 15 14	3454	84 36 29	3457
	Venus	W.	55 23 28	3540	56 43 8	3544	58 2 44	3545	59 22 18	3547
	α Arietis	W.	51 11 53	3110	42 39 51	3110	44 7 48	3112	45 35 43	3113
	Regulus	E.	62 4 32	3080	60 35 58	3086	59 7 30	3089	57 39 7	3092
	Saturn	E.	96 6 17	3060	94 37 19	3066	93 8 27	3069	91 39 39	3071
27	SUN	W.	91 22 10	3463	92 43 16	3463	94 4 22	3463	95 25 28	3461
	Venus	W.	65 59 39	3553	67 19 5	3562	68 38 32	3550	69 58 1	3548
	α Arietis	W.	62 55 10	3112	64 23 5	3111	65 51 1	3110	67 18 59	3108
	Aldebaran	W.	29 54 14	3149	31 21 24	3148	32 48 41	3137	34 16 6	3131
	Mars	W.	27 7 34	3303	28 31 42	3302	29 55 51	3300	31 20 2	3299
	Regulus	E.	50 18 6	3106	48 50 2	3106	47 21 59	3106	45 53 57	3107
	Saturn	E.	84 16 14	3078	82 47 37	3077	81 18 59	3077	79 50 21	3076
28	SUN	W.	102 11 36	3446	103 33 1	3441	104 54 31	3436	106 16 7	3431
	Venus	W.	76 36 5	3539	77 55 54	3537	79 15 48	3522	80 35 48	3515
	α Arietis	W.	74 39 41	3080	76 8 3	3086	77 36 30	3081	79 5 3	3074
	Aldebaran	W.	41 35 2	3090	43 3 13	3093	44 31 31	3087	45 59 57	3079
	Mars	W.	38 21 36	3283	39 46 7	3279	41 10 43	3274	42 35 25	3269
	Regulus	E.	38 33 54	3108	37 5 54	3106	35 37 52	3106	34 9 50	3106
	Spica	E.	92 16 54	3046	90 47 51	3042	89 18 42	3047	87 49 28	3042
	Jupiter	E.	94 56 24	3029	93 26 47	3025	91 57 5	3020	90 27 17	3016
29	α Arietis	W.	86 29 40	3048	87 59 0	3054	89 28 30	3026	90 58 10	3018
	Aldebaran	W.	53 24 26	3030	54 53 50	3031	56 23 24	3022	57 53 10	3012
	Mars	W.	49 40 40	3236	51 6 8	3237	52 31 45	3218	53 57 33	3209
	Saturn	E.	60 33 20	3020	59 3 43	3022	57 33 58	3016	56 4 4	3008
	Spica	E.	80 21 31	3009	78 51 30	3003	77 21 21	2996	75 51 2	2986
	Jupiter	E.	82 56 32	2983	81 25 58	2976	79 55 15	2969	78 24 23	2960
30	α Arietis	W.	98 29 14	2971	100 0 3	2962	101 31 4	2961	103 2 18	2940
	Aldebaran	W.	65 25 3	2961	66 56 5	2950	68 27 21	2939	69 58 51	2937
	Mars	W.	61 9 21	3156	62 36 20	3148	64 3 32	3137	65 30 57	3134
	Pollux	W.	24 54 11	3226	26 17 53	3277	27 42 31	3233	29 8 1	3191
	Saturn	E.	48 32 28	2974	47 1 43	2967	45 30 49	2960	43 59 46	2953
	Spica	E.	68 16 38	2930	66 45 9	2936	65 13 26	2917	63 41 29	2906
	Jupiter	E.	70 47 17	2914	69 15 16	2904	67 43 2	2894	66 10 35	2883
31	Aldebaran	W.	77 40 6	2886	79 13 8	2883	80 46 27	2841	82 20 2	2837
	Mars	W.	72 51 45	3063	74 20 40	3049	75 49 52	3035	77 19 21	3022
	Pollux	W.	36 26 22	3036	37 55 51	3010	39 25 51	2996	40 56 21	2963
	Spica	E.	55 58 8	2847	54 24 41	2836	52 50 59	2823	51 17 1	2810
	Jupiter	E.	58 24 51	2828	56 50 59	2816	55 16 52	2806	53 42 30	2792

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
24	SUN	W.	64° 7' 4"	3365	65° 30' 1"	3374	66° 52' 47"	3383	68° 15' 23"	3392
	Venus	W.	39 19 13	3463	40 40 19	3471	42 1 15	3480	43 22 2	3487
	α Arietis	W.	33 32 42	3063	35 1 12	3065	36 29 40	3067	37 58 6	3068
	Pollux	E.	43 44 53	3123	42 17 11	3141	40 49 51	3159	39 22 53	3178
	Regulus	E.	79 57 25	2994	78 27 5	3005	76 56 58	3014	75 27 3	3022
25	SUN	W.	75 6 7	3428	76 27 52	3433	77 49 31	3438	79 11 4	3443
	Venus	W.	50 3 56	3520	51 23 58	3526	52 43 53	3531	54 3 43	3535
	α Arietis	W.	45 19 36	3101	46 47 44	3104	48 15 49	3106	49 43 52	3107
	Pollux	E.	32 14 13	3294	30 49 54	3324	29 26 10	3356	28 3 3	3390
	Regulus	E.	67 59 51	3058	66 30 50	3065	65 1 57	3070	63 33 11	3076
26	SUN	W.	85 57 41	3460	87 18 50	3462	88 39 57	3463	90 1 3	3462
	Venus	W.	60 41 50	3550	62 1 19	3552	63 20 46	3553	64 40 12	3552
	α Arietis	W.	57 3 37	3114	58 31 30	3114	59 59 23	3114	61 27 16	3113
	Regulus	E.	56 10 48	3098	54 42 33	3098	53 14 21	3101	51 46 12	3103
	Saturn	E.	90 10 54	3073	88 42 11	3075	87 13 31	3076	85 44 52	3077
27	SUN	W.	96 46 36	3459	98 7 46	3456	99 28 59	3454	100 50 15	3449
	Venus	W.	71 17 32	3546	72 37 5	3544	73 56 41	3540	75 16 21	3536
	α Arietis	W.	68 47 1	3105	70 15 5	3101	71 43 13	3098	73 11 25	3095
	Aldebaran	W.	35 43 38	3124	37 11 18	3119	38 39 5	3112	40 7 0	3106
	Mars	W.	32 44 15	3297	34 8 30	3294	35 32 48	3291	37 57 10	3288
	Regulus	E.	44 25 56	3107	42 57 55	3108	41 29 55	3108	40 1 55	3108
	Saturn	E.	78 21 42	3074	76 53 1	3073	75 24 18	3070	73 55 32	3068
28	SUN	W.	107 37 48	3426	108 59 36	3419	110 21 31	3412	111 43 34	3404
	Venus	W.	81 55 55	3509	83 16 9	3503	84 36 30	3496	85 56 59	3487
	α Arietis	W.	80 33 44	3069	82 2 31	3063	83 31 26	3056	85 0 29	3050
	Aldebaran	W.	47 28 32	3073	48 57 16	3065	50 26 9	3056	51 55 12	3047
	Mars	W.	44 0 13	3263	45 25 8	3257	46 50 10	3250	48 15 20	3242
	Regulus	E.	32 41 47	3105	31 13 44	3106	29 45 43	3108	28 17 43	3109
	Spica	E.	86 20 7	3037	84 50 40	3030	83 21 5	3024	81 51 22	3018
	Jupiter	E.	88 57 23	3000	87 27 21	3004	85 57 13	2997	84 26 57	2990
29	α Arietis	W.	92 28 0	3009	93 58 1	3001	95 28 13	2991	96 58 37	2981
	Aldebaran	W.	59 23 8	3003	60 53 17	2993	62 23 39	2982	63 54 14	2971
	Mars	W.	55 23 32	3200	56 49 41	3190	58 16 2	3180	59 42 35	3169
	Saturn	E.	54 34 1	3002	53 3 51	2996	51 33 33	2988	50 3 5	2981
	Spica	E.	74 20 32	2977	72 49 51	2969	71 18 59	2959	69 47 55	2949
	Jupiter	E.	76 53 20	2962	75 22 7	2942	73 50 42	2934	72 19 6	2924
30	α Arietis	W.	104 33 46	2929	106 5 28	2918	107 37 24	2907	109 9 34	2896
	Aldebaran	W.	71 30 35	2915	73 2 35	2903	74 34 50	2891	76 7 20	2879
	Mars	W.	66 58 37	3114	68 26 30	3101	69 54 39	3087	71 23 4	3074
	Pollux	W.	30 34 21	3164	32 1 25	3122	33 29 8	3092	34 57 27	3063
	Saturn	E.	42 28 34	2946	40 57 14	2940	39 25 46	2934	37 54 10	2928
	Spica	E.	62 9 18	2995	60 36 53	2983	59 4 13	2973	57 31 18	2960
	Jupiter	E.	64 37 54	2972	63 4 59	2962	61 31 51	2950	59 58 28	2939
31	Aldebaran	W.	83 53 55	2915	85 28 4	2901	87 2 30	2788	88 37 14	2773
	Mars	W.	78 49 6	3009	80 19 7	2995	81 49 26	2981	83 20 3	2968
	Pollux	W.	42 27 20	2941	43 58 47	2920	45 30 41	2899	47 3 1	2879
	Spica	E.	49 42 46	2797	48 8 14	2784	46 33 25	2771	44 58 19	2757
	Jupiter	E.	52 7 52	2781	50 32 59	2769	48 57 51	2757	47 22 27	2746

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to		Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.	subtracted from Apparent Time.				
Wed.	1	^h 0 ^m 41 ^s 26.96	9.094	N. 4° 27' 44.8"	57.87	16 2.11	64.50	^m 4 ^s 2.09		0.762	
Thur.	2	0 45 5.22	9.099	4 50 51.0	57.66	16 1.84	64.52	3 43.86		0.757	
Fri.	3	0 48 43.60	9.104	5 13 51.9	57.44	16 1.56	64.54	3 25.73		0.752	
Sat.	4	0 52 22.13	9.111	5 36 47.4	57.21	16 1.28	64.56	3 7.75		0.745	
Sun.	5	0 56 0.82	9.118	5 59 37.1	56.96	16 1.00	64.58	2 49.94		0.738	
Mon.	6	0 59 39.68	9.127	6 22 20.6	56.70	16 0.73	64.61	2 32.30		0.730	
Tues.	7	1 3 18.75	9.135	6 44 57.7	56.42	16 0.46	64.64	2 14.87		0.721	
Wed.	8	1 6 58.07	9.145	7 7 27.9	56.13	16 0.18	64.67	1 57.68		0.710	
Thur.	9	1 10 37.65	9.155	7 29 51.1	55.82	15 59.90	64.71	1 40.75		0.701	
Fri.	10	1 14 17.49	9.166	7 52 6.9	55.50	15 59.62	64.75	1 24.08		0.690	
Sat.	11	1 17 57.59	9.178	8 14 14.8	55.17	15 59.34	64.79	1 7.67		0.678	
Sun.	12	1 21 38.00	9.192	8 36 14.4	54.81	15 59.06	64.83	0 51.57		0.664	
Mon.	13	1 25 18.74	9.206	8 58 5.4	54.45	15 58.78	64.88	0 35.80		0.650	
Tues.	14	1 28 59.82	9.220	9 19 47.6	54.08	15 58.50	64.93	0 20.37		0.636	
Wed.	15	1 32 41.24	9.235	9 41 20.7	53.69	15 58.23	64.98	0 5.28		0.621	
Thur.	16	1 36 23.02	9.250	10 2 44.4	53.28	15 57.96	65.03	0 9.45		0.606	
Fri.	17	1 40 5.18	9.266	10 23 58.0	52.86	15 57.69	65.08	0 23.80		0.590	
Sat.	18	1 43 47.72	9.282	10 45 1.3	52.42	15 57.43	65.14	0 37.78		0.574	
Sun.	19	1 47 30.65	9.299	11 5 54.0	51.97	15 57.17	65.20	0 51.37		0.558	
Mon.	20	1 51 14.00	9.316	11 26 35.7	51.51	15 56.91	65.26	1 4.54		0.541	
Tues.	21	1 54 57.77	9.333	11 47 6.1	51.03	15 56.66	65.32	1 17.29		0.523	
Wed.	22	1 58 41.96	9.351	12 7 24.8	50.54	15 56.41	65.38	1 29.62		0.506	
Thur.	23	2 2 26.58	9.369	12 27 31.5	50.03	15 56.16	65.45	1 41.53		0.487	
Fri.	24	2 6 11.64	9.388	12 47 26.0	49.51	15 55.91	65.52	1 52.99		0.468	
Sat.	25	2 9 57.15	9.407	13 7 7.9	48.98	15 55.66	65.59	2 3.99		0.449	
Sun.	26	2 13 43.13	9.427	13 26 36.7	48.43	15 55.42	65.66	2 14.53		0.429	
Mon.	27	2 17 29.58	9.447	13 45 52.2	47.87	15 55.18	65.73	2 24.61		0.409	
Tues.	28	2 21 16.51	9.467	14 4 54.1	47.30	15 54.94	65.80	2 34.20		0.389	
Wed.	29	2 25 3.95	9.488	14 23 42.2	46.71	15 54.70	65.88	2 43.30		0.368	
Thur.	30	2 28 51.89	9.509	14 42 16.1	46.11	15 54.47	65.96	2 51.89		0.347	
Fri.	31	2 32 40.35	9.531	N.15 0 35.5	45.50	15 54.24	66.03	2 59.97		0.325	

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from		Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	added to			
						Mean Time.			
Wed.	1	^h 0 ^m 41 ^s 26.35	9.094	N. 4° 27' 40.9"	57.87	^m 4 ^s 2.15	0.762	^h 0 ^m 37 ^s 24.20	
Thur.	2	0 45 4.66	9.099	4 50 47.4	57.66	3 43.91	0.757	0 41 20.75	
Fri.	3	0 48 43.09	9.104	5 13 48.6	57.44	3 25.78	0.752	0 45 17.31	
Sat.	4	0 52 21.66	9.111	5 36 44.4	57.21	3 7.80	0.745	0 49 13.86	
Sun.	5	0 56 0.89	9.118	5 59 34.4	56.96	2 49.98	0.738	0 53 10.41	
Mon.	6	0 59 39.30	9.127	6 22 18.3	56.70	2 32.34	0.730	0 57 6.96	
Tues.	7	1 3 18.42	9.135	6 44 55.6	56.42	2 14.91	0.721	1 1 8.51	
Wed.	8	1 6 57.78	9.145	7 7 26.1	56.13	1 57.72	0.711	1 5 0.06	
Thur.	9	1 10 37.40	9.155	7 29 49.6	55.82	1 40.78	0.701	1 8 56.62	
Fri.	10	1 14 17.28	9.166	7 52 5.6	55.50	1 24.10	0.690	1 12 53.18	
Sat.	11	1 17 57.42	9.178	8 14 13.7	55.17	1 7.69	0.678	1 16 49.73	
Sun.	12	1 21 37.87	9.192	8 36 13.6	54.81	0 51.58	0.664	1 20 46.29	
Mon.	13	1 25 18.65	9.206	8 58 4.9	54.45	0 35.81	0.650	1 24 42.84	
Tues.	14	1 28 59.77	9.220	9 19 47.3	54.08	0 20.38	0.636	1 28 39.39	
Wed.	15	1 32 41.23	9.235	9 41 20.8	53.69	0 5.28	0.621	1 32 35.95	
Thur.	16	1 36 23.05	9.250	10 2 44.5	53.28	0 9.45	0.606	1 36 32.50	
Fri.	17	1 40 5.25	9.266	10 23 58.2	52.86	0 23.80	0.590	1 40 29.05	
Sat.	18	1 43 47.83	9.282	10 45 1.8	52.42	0 37.78	0.574	1 44 25.61	
Sun.	19	1 47 30.79	9.299	11 5 54.7	51.97	0 51.37	0.558	1 48 22.16	
Mon.	20	1 51 14.17	9.316	11 26 36.6	51.51	1 4.54	0.541	1 52 18.71	
Tues.	21	1 54 57.97	9.333	11 47 7.2	51.03	1 17.30	0.523	1 56 15.27	
Wed.	22	1 58 42.19	9.351	12 7 26.1	50.54	1 29.63	0.506	2 0 11.82	
Thur.	23	2 2 26.84	9.369	12 27 33.0	50.03	1 41.54	0.487	2 4 8.38	
Fri.	24	2 6 11.93	9.388	12 47 27.6	49.51	1 53.00	0.468	2 8 4.93	
Sat.	25	2 9 57.47	9.407	13 7 9.6	48.98	2 4.01	0.449	2 12 1.48	
Sun.	26	2 13 43.48	9.427	13 26 38.5	48.43	2 14.56	0.430	2 15 58.04	
Mon.	27	2 17 29.96	9.447	13 45 54.1	47.87	2 24.63	0.409	2 19 54.59	
Tues.	28	2 21 16.92	9.467	14 4 56.1	47.30	2 34.23	0.389	2 23 51.15	
Wed.	29	2 25 4.38	9.488	14 23 44.3	46.71	2 43.32	0.368	2 27 47.70	
Thur.	30	2 28 52.34	9.509	14 42 18.3	46.11	2 51.91	0.347	2 31 44.25	
Fri.	31	2 32 40.82	9.531	N.15 0 37.8	45.50	2 59.99	0.325	2 35 40.81	

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	91	11° 16' 31.7	16' 3.3	147.80	—0.84	9.9999499	51.5	^h 23 ^m 18 ^s 46.01	
2	92	12 15 37.8	15 9.3	147.71	0.83	0.0000739	51.8	23 14 50.10	
3	93	13 14 41.9	14 13.3	147.63	0.78	.0001985	52.0	23 10 54.20	
4	94	14 13 43.9	13 15.2	147.54	0.70	.0003235	52.2	23 6 58.30	
5	95	15 12 44.0	12 15.2	147.46	0.60	.0004490	52.4	23 3 2.39	
6	96	16 11 42.2	11 13.3	147.38	0.48	.0005748	52.5	22 59 6.48	
7	97	17 10 38.4	10 9.4	147.33	0.35	.0007009	52.6	22 55 10.57	
8	98	18 9 32.8	9 3.7	147.23	0.22	.0008271	52.6	22 51 14.66	
9	99	19 8 25.4	7 56.2	147.16	—0.09	.0009533	52.6	22 47 18.76	
10	100	20 7 16.3	6 47.0	147.09	+0.04	.0010793	52.5	22 43 22.85	
11	101	21 6 5.6	5 36.2	147.02	0.14	.0012049	52.3	22 39 26.94	
12	102	22 4 53.1	4 23.6	146.94	0.23	.0013301	52.1	22 35 31.03	
13	103	23 3 38.9	3 9.3	146.87	0.30	.0014547	51.8	22 31 35.12	
14	104	24 2 22.9	1 53.2	146.79	0.32	.0015786	51.4	22 27 39.22	
15	105	25 1 5.1	0 35.3	146.72	0.31	.0017015	51.0	22 23 43.31	
16	106	25 59 45.6	59 15.7	146.64	0.27	.0018234	50.6	22 19 47.40	
17	107	26 58 24.2	57 54.2	146.57	0.22	.0019442	50.1	22 15 51.49	
18	108	27 57 1.0	56 30.9	146.49	0.14	.0020637	49.6	22 11 55.58	
19	109	28 55 35.9	55 5.7	146.41	+0.02	.0021819	49.0	22 7 59.68	
20	110	29 54 8.8	53 38.5	146.33	—0.10	.0022988	48.5	22 4 3.77	
21	111	30 52 39.7	52 9.3	146.24	0.24	.0024145	47.9	22 0 7.86	
22	112	31 51 8.5	50 38.0	146.16	0.36	.0025289	47.4	21 56 11.95	
23	113	32 49 35.1	49 4.5	146.07	0.49	.0026421	46.9	21 52 16.05	
24	114	33 47 59.7	47 29.0	145.98	0.60	.0027542	46.5	21 48 20.15	
25	115	34 46 22.1	45 51.2	145.89	0.69	.0028653	46.1	21 44 24.24	
26	116	35 44 42.4	44 11.4	145.80	0.76	.0029755	45.7	21 40 28.33	
27	117	36 43 0.7	42 29.6	145.72	0.81	.0030848	45.3	21 36 32.42	
28	118	37 41 17.1	40 45.9	145.64	0.82	.0031934	45.1	21 32 36.51	
29	119	38 39 31.4	39 0.1	145.56	0.79	.0033014	44.8	21 28 40.61	
30	120	39 37 43.7	37 12.2	145.48	0.75	.0034068	44.6	21 24 44.70	
31	121	40 35 54.0	35 22.4	145.40	—0.67	0.0035155	44.3	21 20 48.79	

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

GREENWICH MEAN TIME.										
Day of the Month.	THE MOON'S									
	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.		
1	15' 18.8	15' 24.2	56' 5.5	+1.61	56' 25.2	+1.66	^h 10 ^m 14.4	^m 1.89	^d 12.9	
2	15 29.6	15 35.1	56 45.2	1.67	57 5.2	1.65	11 0.3	1.95	13.9	
3	15 40.5	15 45.6	57 24.8	1.60	57 43.7	1.52	11 48.1	2.04	14.9	
4	15 50.4	15 54.9	58 1.4	1.42	58 17.9	1.30	12 38.4	2.16	15.9	
5	15 58.9	16 2.4	58 32.7	1.15	58 45.7	1.00	13 31.9	2.29	16.9	
6	16 5.5	16 8.0	58 56.8	0.84	59 5.9	0.68	14 28.4	2.40	17.9	
7	16 9.9	16 11.3	59 13.0	0.52	59 18.2	0.36	15 27.2	2.47	18.9	
8	16 12.2	16 12.6	59 21.5	+0.21	59 23.1	+0.06	16 26.9	2.47	19.9	
9	16 12.6	16 12.2	59 23.0	-0.07	59 21.4	-0.18	17 26.1	2.42	20.9	
10	16 11.4	16 10.2	59 18.4	0.29	59 14.2	0.39	18 23.3	2.34	21.9	
11	16 8.8	16 7.0	59 8.9	0.48	59 2.6	0.57	19 17.9	2.25	22.9	
12	16 5.0	16 2.8	58 55.3	0.66	58 47.0	0.74	20 9.7	2.16	23.9	
13	16 0.3	15 57.6	58 37.7	0.81	58 27.6	0.89	20 59.6	2.07	24.9	
14	15 54.5	15 51.2	58 16.5	0.96	58 4.4	1.04	21 48.0	2.01	25.9	
15	15 47.7	15 43.9	57 51.4	1.11	57 37.6	1.19	22 35.9	2.00	26.9	
16	15 39.9	15 35.8	57 23.0	1.24	57 7.8	1.30	23 23.9	2.01	27.9	
17	15 31.5	15 27.0	56 51.9	1.34	56 35.7	1.36	6		28.9	
18	15 22.6	15 18.1	56 19.2	1.37	56 2.9	1.36	0 12.5	2.04	0.4	
19	15 13.7	15 9.4	55 46.7	1.32	55 31.0	1.27	1 1.9	2.07	1.4	
20	15 5.4	15 1.6	55 16.1	1.20	55 2.2	1.10	1 51.9	2.08	2.4	
21	14 58.1	14 55.1	54 49.5	0.99	54 38.4	0.85	2 42.0	2.07	3.4	
22	14 52.6	14 50.5	54 29.0	0.70	54 21.5	0.53	3 31.7	2.04	4.4	
23	14 49.1	14 48.3	54 16.2	-0.34	54 13.2	-0.15	4 20.3	2.00	5.4	
24	14 48.1	14 48.5	54 12.5	+0.04	54 14.2	+0.26	5 7.5	1.94	6.4	
25	14 49.7	14 51.6	54 18.6	0.47	54 25.6	0.69	5 53.4	1.88	7.4	
26	14 54.2	14 57.5	54 35.2	0.90	54 47.2	1.10	6 38.0	1.84	8.4	
27	15 1.4	15 6.0	55 1.6	1.30	55 18.3	1.48	7 22.0	1.83	9.4	
28	15 11.1	15 16.7	55 37.2	1.64	55 57.8	1.78	8 5.9	1.85	10.4	
29	15 22.8	15 29.2	56 20.0	1.90	56 43.5	1.99	8 50.8	1.90	11.4	
30	15 35.8	15 42.5	57 7.8	2.03	57 32.3	2.03	9 37.3	1.99	12.4	
31	15 49.1	15 55.5	57 56.7	+2.01	58 20.3	+1.93	10 26.6	2.13	13.4	

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 1.					FRIDAY 3.				
0	10 33 11.15	1.9760	N. 3 38 34.1	11.888	0	12 10 22.31	2.0020	S. 6 5 40.5	12.127
1	10 35 9.80	1.9781	3 26 43.0	11.866	1	12 12 27.93	2.0066	6 17 47.6	12.107
2	10 37 8.53	1.9794	3 14 50.3	11.891	2	12 14 33.77	2.0091	6 29 53.4	12.088
3	10 39 7.34	1.9808	3 2 56.0	11.918	3	12 16 39.83	2.0098	6 41 58.0	12.067
4	10 41 6.23	1.9821	2 51 0.1	11.944	4	12 18 46.11	2.1066	6 54 1.3	12.044
5	10 43 5.20	1.9835	2 39 2.7	11.969	5	12 20 52.62	2.1104	7 6 3.1	12.020
6	10 45 4.24	1.9848	2 27 3.8	11.993	6	12 22 59.35	2.1142	7 18 3.5	11.996
7	10 47 3.37	1.9860	2 15 3.6	12.015	7	12 25 6.31	2.1181	7 30 2.4	11.968
8	10 49 2.60	1.9879	2 3 2.1	12.036	8	12 27 13.51	2.1220	7 41 59.6	11.940
9	10 51 1.93	1.9896	1 50 59.2	12.067	9	12 29 20.95	2.1260	7 53 55.0	11.911
10	10 53 1.36	1.9918	1 38 55.1	12.078	10	12 31 28.63	2.1300	8 5 48.7	11.880
11	10 55 0.89	1.9931	1 26 49.8	12.098	11	12 33 36.56	2.1341	8 17 40.5	11.849
12	10 57 0.52	1.9948	1 14 43.3	12.116	12	12 35 44.73	2.1382	8 29 30.5	11.815
13	10 59 0.26	1.9966	1 2 35.8	12.133	13	12 37 53.14	2.1423	8 41 18.4	11.779
14	11 1 0.11	1.9985	0 50 27.3	12.160	14	12 40 1.80	2.1464	8 53 4.1	11.743
15	11 3 0.07	2.0004	0 38 17.9	12.165	15	12 42 10.71	2.1506	9 4 47.6	11.707
16	11 5 0.15	2.0023	0 26 7.6	12.179	16	12 44 19.87	2.1549	9 16 28.9	11.670
17	11 7 0.34	2.0043	0 13 56.4	12.194	17	12 46 29.29	2.1592	9 28 7.9	11.631
18	11 9 0.66	2.0063	N. 0 1 44.2	12.207	18	12 48 38.97	2.1636	9 39 44.7	11.592
19	11 11 1.10	2.0084	S. 0 10 28.7	12.220	19	12 50 48.90	2.1678	9 51 19.0	11.550
20	11 13 1.67	2.0106	0 22 42.2	12.231	20	12 52 59.10	2.1721	10 2 50.7	11.505
21	11 15 2.38	2.0128	0 34 56.3	12.241	21	12 55 9.56	2.1765	10 14 19.7	11.460
22	11 17 3.21	2.0150	0 47 11.0	12.249	22	12 57 20.29	2.1810	10 25 46.0	11.416
23	11 19 4.18	2.0174	S. 0 59 26.2	12.256	23	12 59 31.29	2.1855	S. 10 37 9.6	11.370
THURSDAY 2.					SATURDAY 4.				
0	11 21 5.30	2.0198	S. 1 11 41.9	12.266	0	13 1 42.57	2.1900	S. 10 48 30.4	11.322
1	11 23 6.56	2.0223	1 23 58.1	12.273	1	13 3 54.11	2.1946	10 59 48.2	11.273
2	11 25 7.97	2.0248	1 36 14.7	12.278	2	13 6 5.92	2.1991	11 11 2.9	11.219
3	11 27 9.54	2.0274	1 48 31.5	12.282	3	13 8 18.01	2.2037	11 22 14.5	11.167
4	11 29 11.26	2.0300	2 0 48.4	12.284	4	13 10 30.38	2.2084	11 33 22.9	11.114
5	11 31 13.13	2.0326	2 13 5.5	12.286	5	13 12 43.03	2.2131	11 44 28.1	11.061
6	11 33 15.15	2.0361	2 25 22.7	12.287	6	13 14 55.95	2.2177	11 55 30.0	11.004
7	11 35 17.33	2.0377	2 37 40.0	12.288	7	13 17 9.15	2.2224	12 6 28.5	10.945
8	11 37 19.68	2.0405	2 49 57.3	12.288	8	13 19 22.64	2.2271	12 17 23.4	10.886
9	11 39 22.21	2.0434	3 2 14.5	12.287	9	13 21 36.43	2.2320	12 28 14.7	10.826
10	11 41 24.91	2.0464	3 14 31.6	12.285	10	13 23 50.50	2.2369	12 39 2.4	10.766
11	11 43 27.78	2.0494	3 26 48.6	12.282	11	13 26 4.86	2.2417	12 49 46.4	10.700
12	11 45 30.82	2.0523	3 39 5.3	12.277	12	13 28 19.51	2.2466	13 0 26.5	10.635
13	11 47 34.05	2.0553	3 51 21.7	12.270	13	13 30 34.45	2.2514	13 11 2.7	10.569
14	11 49 37.47	2.0584	4 3 37.6	12.262	14	13 32 49.68	2.2562	13 21 34.8	10.502
15	11 51 41.07	2.0616	4 15 53.0	12.253	15	13 35 5.19	2.2610	13 32 2.8	10.434
16	11 53 44.86	2.0648	4 28 7.9	12.243	16	13 37 21.00	2.2659	13 42 26.7	10.364
17	11 55 48.84	2.0680	4 40 22.2	12.233	17	13 39 37.10	2.2707	13 52 46.4	10.293
18	11 57 53.00	2.0712	4 52 35.8	12.221	18	13 41 53.49	2.2756	14 3 1.8	10.220
19	11 59 57.36	2.0746	5 4 48.7	12.209	19	13 44 10.17	2.2805	14 13 12.8	10.146
20	12 2 1.93	2.0780	5 17 0.8	12.196	20	13 46 27.15	2.2855	14 23 19.3	10.071
21	12 4 6.72	2.0814	5 29 12.2	12.183	21	13 48 44.44	2.2905	14 33 21.3	9.996
22	12 6 11.71	2.0849	5 41 22.7	12.167	22	13 51 2.02	2.2955	14 43 18.7	9.916
23	12 8 16.91	2.0884	5 53 32.2	12.149	23	13 53 19.90	2.3004	14 53 11.4	9.840
24	12 10 22.31	2.0920	S. 6 5 40.5	12.127	24	13 55 38.07	2.3052	S. 15 2 59.2	9.764

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 5.					TUESDAY 7.				
0	13 55 38.07	2.3030	S. 15° 2' 59.2	9.754	0	15 51 38.67	2.5120	S. 20° 53' 32.9	4.401
1	13 57 56.53	2.3102	15 12 42.0	9.672	1	15 54 9.53	2.5166	20 57 52.8	4.263
2	14 0 15.29	2.3162	15 22 19.8	9.590	2	15 56 40.54	2.5188	21 2 4.4	4.125
3	14 2 34.36	2.3202	15 31 52.7	9.506	3	15 59 11.71	2.5210	21 6 7.8	3.987
4	14 4 53.71	2.3261	15 41 20.5	9.419	4	16 1 43.06	2.5228	21 10 2.8	3.847
5	14 7 13.36	2.3300	15 50 43.0	9.332	5	16 4 14.58	2.5266	21 13 49.4	3.706
6	14 9 33.31	2.3330	16 0 0.2	9.243	6	16 6 46.27	2.5293	21 17 27.5	3.564
7	14 11 53.55	2.3380	16 9 12.1	9.153	7	16 9 18.10	2.5317	21 20 57.1	3.423
8	14 14 14.09	2.3448	16 18 18.5	9.061	8	16 11 50.06	2.5339	21 24 18.2	3.281
9	14 16 34.93	2.3498	16 27 19.4	8.969	9	16 14 22.16	2.5361	21 27 30.8	3.139
10	14 18 56.07	2.3547	16 36 14.7	8.876	10	16 16 54.40	2.5382	21 30 34.8	2.996
11	14 21 17.51	2.3596	16 45 4.3	8.779	11	16 19 26.76	2.5403	21 33 30.2	2.851
12	14 23 39.23	2.3644	16 53 48.1	8.682	12	16 21 59.23	2.5423	21 36 17.0	2.706
13	14 26 1.23	2.3692	17 2 26.0	8.583	13	16 24 31.82	2.5441	21 38 55.1	2.561
14	14 28 23.52	2.3740	17 10 57.9	8.483	14	16 27 4.52	2.5459	21 41 24.4	2.415
15	14 30 46.11	2.3789	17 19 23.8	8.381	15	16 29 37.32	2.5476	21 43 44.9	2.269
16	14 33 8.99	2.3837	17 27 43.6	8.279	16	16 32 10.22	2.5491	21 45 56.7	2.123
17	14 35 32.15	2.3884	17 35 57.3	8.176	17	16 34 43.22	2.5506	21 47 59.7	1.976
18	14 37 55.59	2.3931	17 44 4.7	8.071	18	16 37 16.30	2.5520	21 49 53.8	1.830
19	14 40 19.32	2.3978	17 52 5.8	7.966	19	16 39 49.46	2.5533	21 51 39.2	1.683
20	14 42 43.33	2.4025	18 0 0.6	7.859	20	16 42 22.69	2.5545	21 53 15.7	1.535
21	14 45 7.61	2.4071	18 7 48.9	7.750	21	16 44 56.00	2.5566	21 54 43.3	1.387
22	14 47 32.17	2.4117	18 15 30.7	7.640	22	16 47 29.37	2.5586	21 56 2.1	1.239
23	14 49 57.01	2.4163	S. 18° 23' 5.8	7.528	23	16 50 2.79	2.5604	S. 21° 57' 12.0	1.091
MONDAY 6.					WEDNESDAY 8.				
0	14 52 22.14	2.4209	S. 18° 30' 34.1	7.416	0	16 52 36.25	2.5620	S. 21° 58' 13.0	0.944
1	14 54 47.53	2.4254	18 37 55.6	7.303	1	16 55 9.75	2.5638	21 59 5.2	0.795
2	14 57 13.18	2.4297	18 45 10.3	7.190	2	16 57 43.28	2.5660	21 59 48.4	0.645
3	14 59 39.09	2.4341	18 52 18.3	7.075	3	17 0 16.83	2.5684	22 0 22.5	0.495
4	15 2 5.26	2.4384	18 59 19.3	6.957	4	17 2 50.41	2.5697	22 0 47.7	0.345
5	15 4 31.69	2.4427	19 6 13.1	6.838	5	17 5 24.01	2.5690	22 1 3.9	0.196
6	15 6 58.39	2.4470	19 12 59.8	6.718	6	17 7 57.62	2.5691	22 1 11.2	0.048
7	15 9 25.35	2.4512	19 19 39.4	6.599	7	17 10 31.23	2.5691	22 1 9.6	0.102
8	15 11 52.55	2.4553	19 26 11.7	6.477	8	17 13 4.84	2.5690	22 0 59.0	0.292
9	15 14 19.99	2.4593	19 32 36.8	6.355	9	17 15 38.44	2.5696	22 0 39.4	0.401
10	15 16 47.67	2.4633	19 38 54.5	6.232	10	17 18 12.02	2.5696	22 0 10.9	0.549
11	15 19 15.59	2.4673	19 45 4.7	6.107	11	17 20 45.58	2.5692	21 59 33.5	0.697
12	15 21 43.75	2.4712	19 51 7.3	5.980	12	17 23 19.12	2.5696	21 58 47.2	0.846
13	15 24 12.15	2.4751	19 57 2.3	5.853	13	17 25 52.62	2.5678	21 57 51.9	0.996
14	15 26 40.77	2.4789	20 2 49.7	5.737	14	17 28 26.06	2.5670	21 56 47.7	1.144
15	15 29 9.61	2.4826	20 8 29.5	5.600	15	17 30 59.45	2.5661	21 55 34.5	1.293
16	15 31 38.67	2.4861	20 14 1.6	5.471	16	17 33 32.80	2.5659	21 54 12.5	1.441
17	15 34 7.95	2.4896	20 19 25.9	5.340	17	17 36 6.09	2.5648	21 52 41.6	1.589
18	15 36 37.45	2.4934	20 24 42.3	5.207	18	17 38 39.33	2.5638	21 51 1.8	1.737
19	15 39 7.16	2.4969	20 29 50.7	5.074	19	17 41 12.49	2.5621	21 49 13.1	1.883
20	15 41 37.07	2.5002	20 34 51.2	4.942	20	17 43 45.57	2.5607	21 47 15.6	2.031
21	15 44 7.17	2.5034	20 39 43.8	4.809	21	17 46 18.57	2.5598	21 45 9.3	2.178
22	15 46 37.48	2.5066	20 44 28.3	4.676	22	17 48 51.49	2.5579	21 42 54.3	2.324
23	15 49 7.98	2.5098	20 49 4.7	4.539	23	17 51 24.31	2.5563	21 40 30.5	2.470
24	15 51 38.67	2.5129	S. 20° 53' 32.9	4.401	24	17 53 57.04	2.5547	S. 21° 37' 57.9	2.616

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 9.					SATURDAY 11.				
0	17 53 57.04	2.5447	S. 21° 37' 57.9	2.616	0	19 52 41.50	2.3926	S. 16° 58' 28.3	8.672
1	17 56 29.66	2.5437	21 35 16.7	2.760	1	19 55 4.33	2.3784	16 49 44.9	8.773
2	17 59 2.16	2.5408	21 32 26.8	2.904	2	19 57 26.91	2.3742	16 40 55.6	8.873
3	18 1 34.55	2.5388	21 29 28.2	3.049	3	19 59 49.24	2.3700	16 32 0.4	8.970
4	18 4 6.82	2.5368	21 26 20.9	3.193	4	20 2 11.30	2.3657	16 22 59.2	9.068
5	18 6 38.96	2.5346	21 23 5.0	3.336	5	20 4 33.10	2.3618	16 13 52.2	9.166
6	18 9 10.96	2.5322	21 19 40.6	3.477	6	20 6 54.65	2.3569	16 4 39.4	9.260
7	18 11 42.82	2.5299	21 16 7.8	3.618	7	20 9 15.93	2.3526	15 55 21.0	9.354
8	18 14 14.54	2.5276	21 12 26.5	3.760	8	20 11 36.95	2.3483	15 45 57.0	9.446
9	18 16 46.13	2.5252	21 8 36.7	3.900	9	20 13 57.72	2.3439	15 36 27.5	9.537
10	18 19 17.57	2.5228	21 4 38.4	4.040	10	20 16 18.22	2.3396	15 26 52.5	9.627
11	18 21 48.84	2.5198	21 0 31.8	4.178	11	20 18 38.46	2.3353	15 17 12.2	9.716
12	18 24 19.93	2.5169	20 56 17.0	4.315	12	20 20 58.45	2.3311	15 7 26.6	9.804
13	18 26 50.86	2.5141	20 51 54.0	4.452	13	20 23 18.19	2.3269	14 57 35.7	9.891
14	18 29 21.62	2.5114	20 47 22.8	4.589	14	20 25 37.68	2.3226	14 47 39.6	9.977
15	18 31 52.22	2.5086	20 42 43.4	4.726	15	20 27 56.91	2.3183	14 37 38.4	10.061
16	18 34 22.64	2.5056	20 37 55.7	4.861	16	20 30 15.88	2.3141	14 27 32.2	10.144
17	18 36 52.87	2.5024	20 32 59.9	4.996	17	20 32 34.60	2.3100	14 17 21.1	10.226
18	18 39 22.91	2.4991	20 27 56.1	5.130	18	20 34 53.08	2.3058	14 7 5.2	10.306
19	18 41 52.76	2.4959	20 22 44.4	5.263	19	20 37 11.30	2.3016	13 56 44.6	10.383
20	18 44 22.41	2.4927	20 17 24.7	5.394	20	20 39 29.27	2.2974	13 46 19.3	10.460
21	18 46 51.87	2.4894	20 11 57.0	5.526	21	20 41 47.00	2.2933	13 35 49.4	10.536
22	18 49 21.13	2.4860	20 6 21.5	5.657	22	20 44 4.48	2.2892	13 25 15.0	10.610
23	18 51 50.18	2.4826	S. 20° 0' 38.2	5.788	23	20 46 21.71	2.2852	S. 13° 14' 36.2	10.683
FRIDAY 10.					SUNDAY 12.				
0	18 54 19.01	2.4790	S. 19° 54' 47.2	5.912	0	20 48 38.70	2.2812	S. 13° 3' 53.0	10.754
1	18 56 47.64	2.4753	19 48 48.7	6.038	1	20 50 55.45	2.2772	12 53 5.6	10.828
2	18 59 16.05	2.4716	19 42 42.6	6.164	2	20 53 11.96	2.2731	12 42 14.1	10.893
3	19 1 44.23	2.4679	19 36 28.8	6.291	3	20 55 28.22	2.2690	12 31 18.5	10.961
4	19 4 12.19	2.4642	19 30 7.5	6.417	4	20 57 44.24	2.2651	12 20 18.8	11.029
5	19 6 39.93	2.4604	19 23 38.8	6.540	5	21 0 0.03	2.2611	12 9 15.1	11.096
6	19 9 7.44	2.4567	19 17 2.7	6.662	6	21 2 15.59	2.2572	11 58 7.5	11.159
7	19 11 34.73	2.4529	19 10 19.3	6.783	7	21 4 30.91	2.2534	11 46 56.1	11.222
8	19 14 1.79	2.4491	19 3 28.7	6.903	8	21 6 46.00	2.2496	11 35 40.9	11.283
9	19 16 28.62	2.4453	18 56 30.9	7.022	9	21 9 0.86	2.2458	11 24 22.1	11.343
10	19 18 55.21	2.4415	18 49 26.0	7.140	10	21 11 15.49	2.2420	11 12 59.7	11.403
11	19 21 21.56	2.4377	18 42 14.1	7.256	11	21 13 29.90	2.2384	11 1 33.8	11.461
12	19 23 47.67	2.4339	18 34 55.3	7.371	12	21 15 44.10	2.2348	10 50 4.4	11.518
13	19 26 13.54	2.4291	18 27 29.6	7.485	13	21 17 58.08	2.2311	10 38 31.7	11.573
14	19 28 39.16	2.4250	18 19 57.0	7.599	14	21 20 11.84	2.2274	10 26 55.7	11.627
15	19 31 4.54	2.4209	18 12 17.5	7.713	15	21 22 25.37	2.2238	10 15 16.5	11.679
16	19 33 29.66	2.4166	18 4 31.3	7.826	16	21 24 38.69	2.2203	10 3 34.1	11.731
17	19 35 54.53	2.4124	17 56 38.4	7.937	17	21 26 51.80	2.2166	9 51 48.7	11.782
18	19 38 19.15	2.4082	17 48 38.9	8.046	18	21 29 4.71	2.2134	9 40 0.4	11.831
19	19 40 43.52	2.4039	17 40 32.9	8.154	19	21 31 17.41	2.2100	9 28 9.1	11.879
20	19 43 7.63	2.3997	17 32 20.5	8.260	20	21 33 29.91	2.2066	9 16 15.0	11.926
21	19 45 31.49	2.3954	17 24 1.8	8.364	21	21 35 42.20	2.2033	9 4 18.1	11.971
22	19 47 55.09	2.3911	17 15 36.8	8.468	22	21 37 54.30	2.2001	8 52 18.5	12.016
23	19 50 18.43	2.3868	17 7 5.6	8.571	23	21 40 6.21	2.1968	8 40 16.3	12.060
24	19 52 41.50	2.3826	S. 16° 58' 28.3	8.673	24	21 42 17.92	2.1936	S. 8° 28' 11.4	12.102

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 13.					WEDNESDAY 15.				
0	21 42 17.92	2.1936	S. 8° 28' 11.4	12.102	0	23 24 51.98	2.0996	N. 1° 37' 22.5	12.679
1	21 44 29.44	2.1906	8 16 4.1	12.141	1	23 26 57.93	2.0989	1 50 2.7	12.662
2	21 46 40.78	2.1876	8 3 54.5	12.180	2	23 29 3.84	2.0981	2 2 41.9	12.644
3	21 48 51.94	2.1846	7 51 42.7	12.218	3	23 31 9.70	2.0973	2 15 20.0	12.626
4	21 51 2.92	2.1815	7 39 28.6	12.255	4	23 33 15.52	2.0966	2 27 57.0	12.607
5	21 53 13.71	2.1785	7 27 12.3	12.290	5	23 35 21.30	2.0960	2 40 32.8	12.588
6	21 55 24.33	2.1756	7 14 53.9	12.324	6	23 37 27.05	2.0957	2 53 7.5	12.569
7	21 57 34.78	2.1727	7 2 33.5	12.356	7	23 39 32.78	2.0954	3 5 40.7	12.548
8	21 59 45.06	2.1699	6 50 11.2	12.387	8	23 41 38.49	2.0950	3 18 12.5	12.525
9	22 1 55.17	2.1671	6 37 47.1	12.417	9	23 43 44.18	2.0946	3 30 42.9	12.499
10	22 4 5.12	2.1645	6 25 21.2	12.446	10	23 45 49.84	2.0943	3 43 11.9	12.470
11	22 6 14.91	2.1619	6 12 53.5	12.475	11	23 47 55.48	2.0938	3 55 39.2	12.442
12	22 8 24.54	2.1593	6 0 24.2	12.501	12	23 50 1.11	2.0936	4 8 4.8	12.413
13	22 10 34.02	2.1567	5 47 53.4	12.526	13	23 52 6.71	2.0935	4 20 28.7	12.383
14	22 12 43.34	2.1541	5 35 21.1	12.550	14	23 54 12.31	2.0934	4 32 50.8	12.353
15	22 14 52.51	2.1517	5 22 47.3	12.574	15	23 56 17.91	2.0933	4 45 11.2	12.322
16	22 17 1.54	2.1494	5 10 12.1	12.597	16	23 58 23.51	2.0933	4 57 29.7	12.291
17	22 19 10.43	2.1470	4 57 35.7	12.618	17	0 0 29.11	2.0932	5 9 46.1	12.258
18	22 21 19.17	2.1446	4 44 58.0	12.637	18	0 2 34.70	2.0932	5 22 0.5	12.222
19	22 23 27.78	2.1424	4 32 19.2	12.655	19	0 4 40.30	2.0933	5 34 12.7	12.186
20	22 25 36.26	2.1401	4 19 39.4	12.672	20	0 6 45.90	2.0934	5 46 22.8	12.150
21	22 27 44.60	2.1378	4 6 58.6	12.688	21	0 8 51.51	2.0936	5 58 30.8	12.114
22	22 29 52.81	2.1359	3 54 16.8	12.704	22	0 10 57.13	2.0938	6 10 36.6	12.077
23	22 32 0.91	2.1340	S. 3 41 34.1	12.718	23	0 13 2.77	2.0941	N. 6 22 40.0	12.038
TUESDAY 14.					THURSDAY 16.				
0	22 34 8.89	2.1320	S. 3 28 50.6	12.731	0	0 15 8.42	2.0943	N. 6 34 41.0	11.996
1	22 36 16.75	2.1300	3 16 6.3	12.742	1	0 17 14.09	2.0946	6 46 39.5	11.964
2	22 38 24.49	2.1280	3 3 21.4	12.752	2	0 19 19.78	2.0949	6 58 35.4	11.910
3	22 40 32.12	2.1261	2 50 36.0	12.761	3	0 21 25.48	2.0953	7 10 28.7	11.867
4	22 42 39.64	2.1243	2 37 50.2	12.767	4	0 23 31.21	2.0957	7 22 19.4	11.823
5	22 44 47.05	2.1226	2 25 4.0	12.773	5	0 25 36.97	2.0961	7 34 7.4	11.778
6	22 46 54.36	2.1210	2 12 17.5	12.778	6	0 27 42.75	2.0966	7 45 52.7	11.731
7	22 49 1.57	2.1195	1 59 30.6	12.782	7	0 29 48.57	2.0971	7 57 35.1	11.683
8	22 51 8.69	2.1180	1 46 43.5	12.785	8	0 31 54.42	2.0977	8 9 14.6	11.634
9	22 53 15.72	2.1164	1 33 56.3	12.787	9	0 34 0.29	2.0982	8 20 51.2	11.585
10	22 55 22.66	2.1149	1 21 9.1	12.787	10	0 36 6.20	2.0988	8 32 24.8	11.536
11	22 57 29.51	2.1135	1 8 21.8	12.787	11	0 38 12.15	2.0995	8 43 55.4	11.486
12	22 59 36.27	2.1121	0 55 34.5	12.786	12	0 40 18.14	2.1001	8 55 22.9	11.433
13	23 1 42.96	2.1108	0 42 47.4	12.783	13	0 42 24.17	2.1008	9 6 47.2	11.379
14	23 3 49.57	2.1096	0 30 0.6	12.778	14	0 44 30.24	2.1016	9 18 8.3	11.325
15	23 5 56.11	2.1083	0 17 14.1	12.773	15	0 46 36.36	2.1024	9 29 26.1	11.269
16	23 8 2.57	2.1071	S. 0 4 27.9	12.766	16	0 48 42.52	2.1031	9 40 40.6	11.213
17	23 10 8.96	2.1060	N. 0 8 17.9	12.760	17	0 50 48.73	2.1039	9 51 51.6	11.156
18	23 12 15.28	2.1048	0 21 3.3	12.753	18	0 52 55.00	2.1048	10 2 59.2	11.098
19	23 14 21.54	2.1038	0 33 48.2	12.744	19	0 55 1.31	2.1056	10 14 3.3	11.038
20	23 16 27.74	2.1029	0 46 32.4	12.734	20	0 57 7.67	2.1065	10 25 3.8	10.978
21	23 18 33.89	2.1019	0 59 16.1	12.723	21	0 59 14.09	2.1075	10 36 0.7	10.918
22	23 20 39.97	2.1009	1 11 59.1	12.710	22	1 1 20.57	2.1085	10 46 54.0	10.858
23	23 22 46.00	2.1001	1 24 41.2	12.696	23	1 3 27.11	2.1095	10 57 43.7	10.797
24	23 24 51.98	2.0996	N. 1 37 22.5	12.679	24	1 5 33.70	2.1104	N. 11 8 29.6	10.734

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 17.					SUNDAY 19.				
0	1 5 33.70	2.1104	N.11° 8' 29.6"	10.734	0	2 48 11.83	2.1033	N.18° 15' 30.1"	6.788
1	1 7 40.35	2.1113	11 19 11.6	10.606	1	2 50 21.83	2.1072	18 22 14.5	6.691
2	1 9 47.06	2.1128	11 29 49.7	10.603	2	2 52 31.89	2.1092	18 28 53.0	6.593
3	1 11 53.82	2.1132	11 40 23.8	10.836	3	2 54 42.01	2.1092	18 35 25.7	6.494
4	1 14 0.64	2.1143	11 50 54.0	10.470	4	2 56 52.19	2.1702	18 41 52.4	6.396
5	1 16 7.53	2.1144	12 1 20.2	10.403	5	2 59 2.42	2.1711	18 48 13.2	6.297
6	1 18 14.50	2.1166	12 11 42.3	10.336	6	3 1 12.71	2.1720	18 54 28.0	6.198
7	1 20 21.53	2.1178	12 22 0.3	10.268	7	3 3 23.05	2.1728	19 0 36.7	6.099
8	1 22 28.63	2.1190	12 32 14.1	10.194	8	3 5 33.44	2.1736	19 6 39.4	5.996
9	1 24 35.79	2.1200	12 42 23.6	10.122	9	3 7 43.89	2.1745	19 12 36.2	5.896
10	1 26 43.03	2.1212	12 52 28.9	10.052	10	3 9 54.39	2.1754	19 18 26.9	5.798
11	1 28 50.34	2.1224	13 2 29.9	9.980	11	3 12 4.93	2.1761	19 24 11.4	5.699
12	1 30 57.72	2.1226	13 12 26.5	9.908	12	3 14 15.50	2.1766	19 29 49.7	5.598
13	1 33 5.16	2.1247	13 22 18.6	9.831	13	3 16 26.12	2.1778	19 35 21.9	5.498
14	1 35 12.67	2.1259	13 32 6.2	9.756	14	3 18 36.78	2.1780	19 40 47.9	5.398
15	1 37 20.26	2.1271	13 41 49.3	9.680	15	3 20 47.48	2.1786	19 46 7.8	5.298
16	1 39 27.93	2.1283	13 51 27.8	9.604	16	3 22 58.22	2.1798	19 51 21.5	5.198
17	1 41 35.67	2.1295	14 1 1.7	9.527	17	3 25 9.00	2.1800	19 56 29.0	5.099
18	1 43 43.47	2.1307	14 10 31.0	9.449	18	3 27 19.81	2.1806	20 1 30.2	4.997
19	1 45 51.35	2.1319	14 19 55.7	9.371	19	3 29 30.65	2.1809	20 6 25.1	4.893
20	1 47 59.30	2.1331	14 29 15.6	9.293	20	3 31 41.52	2.1813	20 11 13.7	4.789
21	1 50 7.33	2.1344	14 38 30.7	9.215	21	3 33 52.41	2.1817	20 15 56.1	4.684
22	1 52 15.44	2.1357	14 47 40.9	9.139	22	3 36 3.33	2.1822	20 20 32.2	4.580
23	1 54 23.62	2.1370	N.14 56 46.2	9.048	23	3 38 14.28	2.1826	N.20 25 2.0	4.444
SATURDAY 18.					MONDAY 20.				
0	1 56 31.88	2.1383	N.15 5 46.6	8.965	0	3 40 25.25	2.1830	N.20 29 25.4	4.338
1	1 58 40.21	2.1395	15 14 42.0	8.890	1	3 42 36.24	2.1834	20 33 42.5	4.231
2	2 0 48.61	2.1407	15 23 32.3	8.795	2	3 44 47.25	2.1836	20 37 53.2	4.125
3	2 2 57.09	2.1419	15 32 17.5	8.710	3	3 46 58.27	2.1837	20 41 57.5	4.019
4	2 5 5.65	2.1432	15 40 57.6	8.636	4	3 49 9.30	2.1839	20 45 55.4	3.911
5	2 7 14.28	2.1444	15 49 32.6	8.541	5	3 51 20.34	2.1841	20 49 46.9	3.806
6	2 9 22.98	2.1456	15 58 2.6	8.456	6	3 53 31.39	2.1843	20 53 32.0	3.698
7	2 11 31.76	2.1469	16 6 27.3	8.369	7	3 55 42.45	2.1843	20 57 10.6	3.591
8	2 13 40.61	2.1481	16 14 46.6	8.279	8	3 57 53.51	2.1845	21 0 42.8	3.484
9	2 15 49.54	2.1494	16 23 0.6	8.190	9	4 0 4.57	2.1845	21 4 8.6	3.376
10	2 17 58.54	2.1506	16 31 9.3	8.100	10	4 2 15.64	2.1844	21 7 27.9	3.267
11	2 20 7.62	2.1519	16 39 12.6	8.010	11	4 4 26.71	2.1844	21 10 40.7	3.160
12	2 22 16.77	2.1531	16 47 10.6	7.921	12	4 6 37.77	2.1845	21 13 47.0	3.053
13	2 24 25.98	2.1543	16 55 3.1	7.829	13	4 8 48.82	2.1841	21 16 46.9	2.944
14	2 26 35.26	2.1553	17 2 50.0	7.738	14	4 10 59.86	2.1838	21 19 40.3	2.836
15	2 28 44.61	2.1564	17 10 31.4	7.646	15	4 13 10.88	2.1836	21 22 27.2	2.727
16	2 30 54.03	2.1576	17 18 7.3	7.553	16	4 15 21.89	2.1834	21 25 7.6	2.619
17	2 33 3.52	2.1588	17 25 37.6	7.458	17	4 17 32.88	2.1830	21 27 41.5	2.513
18	2 35 13.08	2.1599	17 33 2.2	7.364	18	4 19 43.85	2.1827	21 30 9.0	2.404
19	2 37 22.71	2.1610	17 40 21.2	7.270	19	4 21 54.80	2.1824	21 32 30.0	2.296
20	2 39 32.40	2.1621	17 47 34.5	7.176	20	4 24 5.73	2.1820	21 34 44.4	2.188
21	2 41 42.16	2.1633	17 54 42.1	7.079	21	4 26 16.63	2.1816	21 36 52.2	2.077
22	2 43 51.99	2.1643	18 1 43.9	6.981	22	4 28 27.50	2.1809	21 38 53.5	1.968
23	2 46 1.88	2.1653	18 8 39.9	6.885	23	4 30 38.33	2.1808	21 40 48.4	1.860
24	2 48 11.83	2.1663	N.18 15 30.1	6.789	24	4 32 49.13	2.1796	N.21 42 36.9	1.744

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 21.					THURSDAY 23.				
0	4 32 49.13	2.1796	N.21° 42' 36.9	1.764	0	6 16 2.71	2.1089	N.21° 4' 37.2	2.343
1	4 34 59.89	2.1790	21 44 18.9	1.646	1	6 18 9.18	2.1067	21 1 19.8	2.329
2	4 37 10.61	2.1783	21 45 54.4	1.587	2	6 20 15.52	2.1045	20 57 56.6	2.435
3	4 39 21.29	2.1777	21 47 23.3	1.499	3	6 22 21.72	2.1024	20 54 27.6	2.531
4	4 41 31.93	2.1769	21 48 45.8	1.391	4	6 24 27.80	2.1003	20 50 52.9	2.626
5	4 43 42.52	2.1761	21 50 1.8	1.212	5	6 26 33.75	2.0979	20 47 12.5	2.731
6	4 45 53.06	2.1752	21 51 11.2	1.104	6	6 28 39.56	2.0956	20 43 26.3	2.816
7	4 48 3.55	2.1744	21 52 14.2	0.996	7	6 30 45.23	2.0934	20 39 34.5	2.910
8	4 50 13.99	2.1736	21 53 10.7	0.889	8	6 32 50.77	2.0913	20 35 37.0	3.005
9	4 52 24.38	2.1737	21 54 0.8	0.781	9	6 34 56.19	2.0889	20 31 33.9	3.099
10	4 54 34.72	2.1717	21 54 44.4	0.672	10	6 37 1.46	2.0866	20 27 25.3	3.191
11	4 56 44.99	2.1707	21 55 21.5	0.564	11	6 39 6.59	2.0844	20 23 11.1	3.283
12	4 58 55.19	2.1696	21 55 52.1	0.456	12	6 41 11.59	2.0821	20 18 51.3	3.375
13	5 1 5.33	2.1684	21 56 16.3	0.351	13	6 43 16.45	2.0798	20 14 26.1	3.466
14	5 3 15.40	2.1672	21 56 34.2	0.245	14	6 45 21.17	2.0776	20 9 55.4	3.557
15	5 5 25.39	2.1660	21 56 45.7	0.139	15	6 47 25.75	2.0752	20 5 19.2	3.648
16	5 7 35.31	2.1648	21 56 50.8	0.032	16	6 49 30.20	2.0730	20 0 37.6	3.738
17	5 9 45.16	2.1636	21 56 49.5	0.075	17	6 51 34.51	2.0706	19 55 50.6	3.828
18	5 11 54.94	2.1623	21 56 41.7	0.183	18	6 53 38.67	2.0682	19 50 58.2	3.918
19	5 14 4.63	2.1609	21 56 27.5	0.290	19	6 55 42.69	2.0659	19 46 0.5	4.006
20	5 16 14.24	2.1596	21 56 7.0	0.395	20	6 57 46.57	2.0636	19 40 57.5	4.094
21	5 18 23.78	2.1582	21 55 40.3	0.500	21	6 59 50.32	2.0613	19 35 49.2	4.182
22	5 20 33.23	2.1567	21 55 7.2	0.605	22	7 1 53.92	2.0589	19 30 35.7	4.269
23	5 22 42.59	2.1552	N.21 54 27.7	0.710	23	7 3 57.38	2.0566	N.19 25 16.9	4.357
WEDNESDAY 22.					FRIDAY 24.				
0	5 24 51.86	2.1538	N.21 53 41.8	0.815	0	7 6 0.70	2.0543	N.19 19 52.9	4.443
1	5 27 1.04	2.1522	21 52 49.7	0.920	1	7 8 3.88	2.0519	19 14 23.8	4.529
2	5 29 10.12	2.1506	21 51 51.4	1.024	2	7 10 6.92	2.0496	19 8 49.5	4.615
3	5 31 19.11	2.1490	21 50 47.0	1.127	3	7 12 9.83	2.0472	19 3 10.1	4.700
4	5 33 28.00	2.1473	21 49 36.3	1.231	4	7 14 12.59	2.0449	18 57 25.6	4.784
5	5 35 36.79	2.1457	21 48 19.3	1.335	5	7 16 15.21	2.0426	18 51 36.0	4.869
6	5 37 45.48	2.1440	21 46 55.9	1.439	6	7 18 17.69	2.0403	18 45 41.4	4.953
7	5 39 54.07	2.1422	21 45 26.4	1.542	7	7 20 20.04	2.0380	18 39 41.8	5.038
8	5 42 2.55	2.1404	21 43 50.8	1.644	8	7 22 22.25	2.0356	18 33 37.2	5.118
9	5 44 10.92	2.1387	21 42 9.1	1.746	9	7 24 24.31	2.0333	18 27 27.7	5.200
10	5 46 19.19	2.1369	21 40 21.2	1.850	10	7 26 26.24	2.0311	18 21 13.3	5.281
11	5 48 27.35	2.1350	21 38 27.1	1.953	11	7 28 28.04	2.0289	18 14 54.0	5.362
12	5 50 35.39	2.1331	21 36 26.8	2.056	12	7 30 29.71	2.0266	18 8 29.8	5.443
13	5 52 43.32	2.1313	21 34 20.5	2.158	13	7 32 31.24	2.0243	18 2 0.8	5.523
14	5 54 51.14	2.1294	21 32 8.2	2.255	14	7 34 32.63	2.0221	17 55 27.0	5.603
15	5 56 58.85	2.1274	21 29 50.0	2.355	15	7 36 33.89	2.0199	17 48 48.5	5.682
16	5 59 6.43	2.1254	21 27 25.7	2.455	16	7 38 35.02	2.0177	17 42 5.2	5.761
17	6 1 13.89	2.1234	21 24 55.4	2.555	17	7 40 36.02	2.0156	17 35 17.2	5.839
18	6 3 21.24	2.1214	21 22 19.0	2.654	18	7 42 36.88	2.0133	17 28 24.6	5.915
19	6 5 28.47	2.1193	21 19 36.8	2.753	19	7 44 37.61	2.0111	17 21 27.4	5.991
20	6 7 35.57	2.1173	21 16 48.7	2.851	20	7 46 38.22	2.0090	17 14 25.6	6.068
21	6 9 42.55	2.1153	21 13 54.6	2.949	21	7 48 38.70	2.0069	17 7 19.1	6.145
22	6 11 49.40	2.1131	21 10 54.7	3.047	22	7 50 39.05	2.0047	17 0 8.1	6.221
23	6 13 56.12	2.1110	21 7 48.9	3.145	23	7 52 39.28	2.0027	16 52 52.5	6.297
24	6 16 2.71	2.1089	N.21 4 37.2	3.243	24	7 54 39.40	2.0007	N.16 45 32.4	6.370

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 25.					MONDAY 27.				
0	7 54 39.40	2.0007	N. 16° 45' 32.4"	7.370	0	9 28 51.55	1.9378	N. 9° 35' 35.9"	10.339
1	7 56 39.38	1.9987	16 38 8.0	7.444	1	9 30 47.81	1.9376	9 25 14.1	10.386
2	7 58 39.24	1.9968	16 30 39.1	7.519	2	9 32 44.06	1.9373	9 14 49.4	10.436
3	8 0 38.99	1.9948	16 23 5.7	7.592	3	9 34 40.29	1.9370	9 4 21.8	10.483
4	8 2 38.62	1.9928	16 15 28.0	7.664	4	9 36 36.50	1.9366	8 53 51.4	10.530
5	8 4 38.13	1.9908	16 7 46.0	7.736	5	9 38 32.71	1.9366	8 43 18.2	10.576
6	8 6 37.51	1.9888	15 59 59.7	7.808	6	9 40 28.92	1.9367	8 32 42.1	10.622
7	8 8 36.78	1.9869	15 52 9.1	7.879	7	9 42 25.12	1.9366	8 22 3.4	10.667
8	8 10 35.94	1.9851	15 44 14.2	7.950	8	9 44 21.31	1.9366	8 11 22.0	10.712
9	8 12 34.99	1.9834	15 36 15.1	8.020	9	9 46 17.50	1.9367	8 0 37.9	10.757
10	8 14 33.94	1.9816	15 28 11.8	8.090	10	9 48 13.70	1.9366	7 49 51.1	10.801
11	8 16 32.78	1.9797	15 20 4.4	8.159	11	9 50 9.92	1.9371	7 39 1.7	10.844
12	8 18 31.50	1.9778	15 11 52.8	8.227	12	9 52 6.17	1.9374	7 28 9.8	10.886
13	8 20 30.12	1.9761	15 3 37.2	8.296	13	9 54 2.43	1.9377	7 17 15.5	10.926
14	8 22 28.64	1.9745	14 55 17.5	8.362	14	9 55 58.70	1.9379	7 6 18.7	10.967
15	8 24 27.06	1.9728	14 46 53.8	8.428	15	9 57 54.98	1.9382	6 55 19.4	11.008
16	8 26 25.38	1.9711	14 38 26.1	8.495	16	9 59 51.28	1.9386	6 44 17.6	11.048
17	8 28 23.59	1.9695	14 29 54.4	8.561	17	10 1 47.61	1.9391	6 33 13.5	11.087
18	8 30 21.71	1.9680	14 21 18.7	8.627	18	10 3 43.98	1.9396	6 22 7.0	11.126
19	8 32 19.74	1.9665	14 12 39.2	8.691	19	10 5 40.37	1.9401	6 10 58.3	11.164
20	8 34 17.68	1.9650	14 3 55.8	8.756	20	10 7 36.79	1.9406	5 59 47.4	11.201
21	8 36 15.53	1.9634	13 55 8.5	8.819	21	10 9 33.24	1.9411	5 48 34.2	11.238
22	8 38 13.29	1.9619	13 46 17.5	8.882	22	10 11 29.73	1.9416	5 37 18.8	11.275
23	8 40 10.96	1.9605	N. 13° 37' 22.7"	8.944	23	10 13 26.27	1.9426	N. 5° 26' 1.2"	11.311
SUNDAY 26.					TUESDAY 28.				
0	8 42 8.54	1.9592	N. 13° 28' 24.1"	9.007	0	10 15 22.87	1.9438	N. 5° 14' 41.5"	11.346
1	8 44 6.04	1.9579	13 19 21.7	9.069	1	10 17 19.52	1.9447	5 3 19.7	11.379
2	8 46 3.47	1.9565	13 10 15.7	9.130	2	10 19 16.23	1.9457	4 51 56.0	11.411
3	8 48 0.83	1.9552	13 1 6.1	9.190	3	10 21 13.01	1.9466	4 40 30.4	11.443
4	8 49 58.10	1.9539	12 51 52.8	9.251	4	10 23 9.85	1.9478	4 29 2.8	11.475
5	8 51 55.30	1.9526	12 42 35.9	9.311	5	10 25 6.75	1.9488	4 17 33.3	11.507
6	8 53 52.43	1.9515	12 33 15.5	9.369	6	10 27 3.70	1.9498	4 6 1.9	11.537
7	8 55 49.49	1.9505	12 23 51.6	9.427	7	10 29 0.73	1.9510	3 54 28.8	11.567
8	8 57 46.49	1.9494	12 14 24.2	9.486	8	10 30 57.84	1.9524	3 42 53.9	11.597
9	8 59 43.42	1.9484	12 4 53.2	9.545	9	10 32 55.04	1.9539	3 31 17.2	11.626
10	9 1 40.29	1.9475	11 55 18.8	9.602	10	10 34 52.32	1.9554	3 19 38.7	11.654
11	9 3 37.11	1.9465	11 45 41.0	9.659	11	10 36 49.68	1.9568	3 7 58.6	11.681
12	9 5 33.88	1.9456	11 35 59.8	9.716	12	10 38 47.13	1.9584	2 56 17.0	11.706
13	9 7 30.59	1.9447	11 26 15.3	9.769	13	10 40 44.68	1.9600	2 44 33.9	11.731
14	9 9 27.25	1.9439	11 16 27.5	9.822	14	10 42 42.33	1.9616	2 32 49.3	11.756
15	9 11 23.86	1.9431	11 6 36.5	9.877	15	10 44 40.07	1.9632	2 21 3.1	11.781
16	9 13 20.42	1.9423	10 56 42.3	9.930	16	10 46 37.91	1.9649	2 9 15.5	11.806
17	9 15 16.94	1.9416	10 46 44.9	9.983	17	10 48 35.86	1.9667	1 57 26.5	11.828
18	9 17 13.41	1.9410	10 36 44.2	10.036	18	10 50 33.93	1.9687	1 45 36.2	11.850
19	9 19 9.85	1.9404	10 26 40.4	10.087	19	10 52 32.11	1.9707	1 33 44.6	11.871
20	9 21 6.26	1.9398	10 16 33.6	10.138	20	10 54 30.41	1.9727	1 21 51.7	11.891
21	9 23 2.63	1.9392	10 6 23.7	10.189	21	10 56 28.82	1.9746	1 9 57.6	11.911
22	9 24 58.97	1.9387	9 56 10.8	10.240	22	10 58 27.35	1.9767	0 58 2.3	11.930
23	9 26 55.27	1.9383	9 45 54.9	10.290	23	11 0 26.02	1.9789	0 46 5.9	11.949
24	9 28 51.55	1.9379	N. 9° 35' 35.9"	10.339	24	11 2 24.83	1.9813	N. 0° 34' 8.5"	11.966

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 29.					THURSDAY 30.				
0	11 2 24.83	1.9812	N. 0 34 8.5	11.965	0	11 50 44.79	2.0622	S. 4 15 54.8	12.117
1	11 4 23.77	1.9835	0 22 10.2	11.980	1	11 52 48.02	2.0638	4 28 1.6	12.109
2	11 6 22.85	1.9858	N. 0 10 11.0	11.994	2	11 54 51.49	2.0656	4 40 7.9	12.101
3	11 8 22.06	1.9881	S. 0 1 49.1	12.009	3	11 56 55.20	2.0638	4 52 13.7	12.092
4	11 10 21.42	1.9905	0 13 50.1	12.024	4	11 58 59.14	2.0677	5 4 19.0	12.084
5	11 12 20.93	1.9931	0 25 52.0	12.038	5	12 1 3.32	2.0717	5 16 23.8	12.075
6	11 14 20.60	1.9957	0 37 54.7	12.051	6	12 3 7.73	2.0756	5 28 28.0	12.063
7	11 16 20.42	1.9984	0 49 58.2	12.064	7	12 5 12.38	2.0796	5 40 31.4	12.051
8	11 18 20.40	2.0011	1 2 2.4	12.076	8	12 7 17.28	2.0837	5 52 34.0	12.038
9	11 20 20.55	2.0039	1 14 7.3	12.087	9	12 9 22.43	2.0879	6 4 35.8	12.023
10	11 22 20.86	2.0066	1 26 12.8	12.096	10	12 11 27.83	2.0921	6 16 36.7	12.007
11	11 24 21.34	2.0096	1 38 18.8	12.104	11	12 13 33.48	2.0963	6 28 36.6	11.989
12	11 26 22.00	2.0124	1 50 25.2	12.110	12	12 15 39.39	2.1007	6 40 35.5	11.970
13	11 28 22.83	2.0153	2 2 32.0	12.116	13	12 17 45.56	2.1050	6 52 33.2	11.962
14	11 30 23.84	2.0183	2 14 39.0	12.120	14	12 19 51.99	2.1094	7 4 29.7	11.933
15	11 32 25.03	2.0214	2 26 46.3	12.124	15	12 21 58.69	2.1140	7 16 25.1	11.913
16	11 34 26.41	2.0246	2 38 53.8	12.127	16	12 24 5.67	2.1186	7 28 19.2	11.890
17	11 36 27.99	2.0280	2 51 1.5	12.129	17	12 26 12.92	2.1231	7 40 11.8	11.866
18	11 38 29.78	2.0315	3 3 9.3	12.130	18	12 28 20.44	2.1277	7 52 3.0	11.842
19	11 40 31.77	2.0349	3 15 17.1	12.130	19	12 30 28.24	2.1326	8 3 52.8	11.816
20	11 42 33.96	2.0383	3 27 24.9	12.129	20	12 32 36.33	2.1379	8 15 41.1	11.789
21	11 44 36.34	2.0416	3 39 32.6	12.127	21	12 34 44.71	2.1420	8 27 27.7	11.762
22	11 46 38.94	2.0451	3 51 40.2	12.124	22	12 36 53.38	2.1467	8 39 12.6	11.733
23	11 48 41.76	2.0487	4 3 47.6	12.121	23	12 39 2.35	2.1516	8 50 55.8	11.703
24	11 50 44.79	2.0523	S. 4 15 54.8	12.117	24	12 41 11.64	2.1568	S. 9 2 37.2	11.668

PHASES OF THE MOON.

○ Full Moon,	d	h	m
☾ Last Quarter,	3	16	9.0
● New Moon,	10	13	23.1
☾ First Quarter,	17	15	5.3
	25	16	7.7

☾ Perigee,	d	h
☾ Apogee,	8	17.3
	23	21.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Aldebaran W.	90° 12' 17"	2760	91° 47' 37"	2747	93° 23' 14"	2784	94° 59' 9"	2719
	Mars W.	84 50 58	2953	86 22 10	2939	87 53 40	2924	89 25 28	2911
	Pollux W.	48 35 47	2659	50 8 58	2641	51 42 33	2623	53 16 31	2606
	Spica E.	43 22 55	2744	41 47 14	2731	40 11 15	2719	38 35 0	2704
	Jupiter E.	45 46 48	2735	44 10 54	2723	42 34 45	2712	40 58 21	2701
	Antares E.	88 53 17	2753	87 17 48	2741	85 42 2	2737	84 5 58	2718
2	Mars W.	97 8 57	2640	98 42 33	2626	100 16 28	2612	101 50 40	2796
	Pollux W.	61 12 9	2719	62 48 23	2704	64 24 58	2689	66 1 54	2673
	Regulus W.	24 11 2	2744	25 46 43	2719	27 22 57	2695	28 59 43	2678
	Antares E.	76 1 6	2647	74 23 15	2633	72 45 5	2620	71 6 37	2607
3	Pollux W.	74 11 33	2601	75 50 26	2586	77 29 37	2575	79 9 6	2562
	Regulus W.	37 10 26	2681	38 49 47	2665	40 29 30	2649	42 9 35	2636
	Antares E.	62 49 57	2602	61 9 46	2584	59 29 20	2572	57 48 38	2611
4	Pollux W.	87 30 45	2505	89 11 51	2494	90 53 12	2484	92 34 47	2475
	Regulus W.	50 34 49	2469	52 16 46	2458	53 58 59	2446	55 41 28	2435
	Antares E.	49 21 22	2460	47 39 13	2452	45 56 52	2443	44 14 19	2435
	α Aquilæ E.	101 55 2	2691	100 22 32	2676	98 49 43	2662	97 16 36	2649
5	Regulus W.	64 17 34	2367	66 1 27	2379	67 45 32	2371	69 29 48	2363
	Saturn W.	31 29 32	2466	33 11 34	2447	34 54 2	2430	36 36 54	2415
	Antares E.	35 38 59	2405	33 55 32	2401	32 11 59	2396	30 28 22	2396
	α Aquilæ E.	89 27 13	2600	87 52 45	2792	86 18 7	2786	84 43 21	2782
6	Regulus W.	78 13 44	2331	79 58 58	2326	81 44 19	2322	83 29 47	2317
	Saturn W.	45 16 3	2307	47 0 40	2348	48 45 30	2339	50 30 32	2332
	Spica W.	24 11 6	2320	25 56 36	2315	27 42 14	2309	29 28 0	2304
	Jupiter W.	23 6 19	2380	24 50 22	2362	26 34 51	2347	28 19 42	2333
	α Aquilæ E.	76 48 34	2775	75 13 34	2779	73 38 39	2763	72 3 49	2766
7	Regulus W.	92 18 37	2299	94 4 38	2296	95 50 41	2295	97 36 47	2294
	Saturn W.	59 18 4	2304	61 3 57	2300	62 49 56	2297	64 36 0	2294
	Spica W.	38 18 35	2284	40 4 58	2281	41 51 25	2279	43 37 55	2277
	Jupiter W.	37 8 10	2267	38 54 28	2262	40 40 54	2277	42 27 28	2272
	α Aquilæ E.	64 12 0	2636	62 38 22	2655	61 5 6	2671	59 32 12	2693
8	Saturn W.	73 27 20	2283	75 13 44	2283	77 0 9	2282	78 46 35	2282
	Spica W.	52 31 8	2270	54 17 51	2270	56 4 34	2270	57 51 17	2269
	Jupiter W.	51 21 43	2257	53 8 46	2255	54 55 51	2254	56 42 58	2253
	α Aquilæ E.	51 55 19	2641	50 25 57	2681	48 57 24	2724	47 29 44	2778
	SUN E.	123 44 43	2593	122 5 39	2692	120 26 33	2691	118 47 26	2691
9	Saturn W.	87 38 43	2284	89 25 6	2285	91 11 27	2287	92 57 45	2289
	Spica W.	66 44 54	2273	68 31 34	2274	70 18 12	2276	72 4 47	2277
	Jupiter W.	65 38 44	2253	67 25 53	2253	69 13 1	2254	71 0 7	2256
	Antares W.	21 40 20	2353	23 24 48	2354	25 9 29	2346	26 54 22	2329
	SUN E.	110 31 50	2593	108 52 45	2593	107 13 41	2595	105 34 39	2597
10	Saturn W.	101 48 29	2302	103 34 26	2304	105 20 19	2306	107 6 7	2311
	Spica W.	80 57 3	2287	82 43 21	2290	84 29 35	2293	86 15 45	2296
	Jupiter W.	79 55 4	2265	81 41 55	2268	83 28 42	2270	85 15 25	2273
	Antares W.	35 40 32	2324	37 25 56	2324	39 11 21	2324	40 56 46	2324
	SUN E.	97 20 8	2607	95 41 22	2609	94 2 40	2612	92 24 2	2615

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Aldebaran W.	96° 35' 23"	2707	98° 11' 54"	2693	99° 48' 43"	2680	101° 25' 50"	2666
	Mars W.	90 57 33	2696	92 29 57	2682	94 2 39	2668	95 33 39	2654
	Pollux W.	54 50 53	2787	56 25 38	2769	58 0 46	2753	59 36 16	2735
	Spica E.	36 58 26	2692	35 21 35	2678	33 44 26	2665	32 6 59	2652
	Jupiter E.	39 21 42	2691	37 44 50	2681	36 7 44	2672	34 30 26	2662
	Antares E.	82 29 35	2690	80 52 54	2687	79 15 56	2673	77 38 40	2660
2	Mars W.	103 25 11	2784	104 59 59	2771	106 35 5	2758	108 10 28	2744
	Pollux W.	67 39 10	2696	69 16 46	2643	70 54 42	2629	72 32 58	2616
	Regulus W.	30 36 59	2652	32 14 43	2632	33 52 53	2615	35 31 28	2598
	Antares E.	69 27 51	2693	67 48 47	2682	66 9 27	2669	64 29 50	2656
3	Pollux W.	80 48 53	2650	82 28 57	2538	84 9 17	2527	85 49 53	2515
	Regulus W.	43 50 0	2620	45 30 45	2507	47 11 48	2494	48 53 10	2484
	Antares E.	56 7 40	2501	54 26 28	2480	52 45 0	2460	51 3 18	2470
4	Pollux W.	94 16 35	2487	95 58 35	2456	97 40 48	2450	99 23 12	2442
	Regulus W.	57 24 13	2426	59 7 12	2415	60 50 26	2405	62 33 53	2396
	Antares E.	42 31 34	2427	40 48 38	2421	39 5 33	2415	37 22 20	2410
	α Aquilæ E.	95 43 12	2638	94 9 33	2626	92 35 39	2616	91 1 32	2607
5	Regulus W.	71 14 16	2356	72 58 54	2349	74 43 42	2343	76 28 39	2337
	Saturn W.	38 20 7	2401	40 3 40	2386	41 47 32	2377	43 31 40	2366
	Antares E.	28 44 42	2397	27 1 2	2399	25 17 23	2400	23 33 48	2403
	α Aquilæ E.	83 8 30	2779	81 33 35	2776	79 58 36	2775	78 23 35	2775
6	Regulus W.	85 15 22	2313	87 1 3	2309	88 46 49	2306	90 32 40	2302
	Saturn W.	52 15 45	2325	54 1 8	2320	55 46 39	2314	57 32 18	2309
	Spica W.	31 13 54	2298	32 59 56	2294	34 46 4	2291	36 32 17	2287
	Jupiter W.	30 4 53	2330	31 50 23	2311	33 36 7	2302	35 22 3	2296
	α Aquilæ E.	70 29 5	2795	68 54 31	2804	67 20 8	2813	65 45 57	2822
7	Regulus W.	99 22 56	2292	101 9 7	2291	102 55 20	2290	104 41 34	2290
	Saturn W.	66 22 9	2291	68 8 22	2286	69 54 39	2287	71 40 58	2286
	Spica W.	45 24 29	2274	47 11 6	2273	48 57 45	2272	50 44 26	2271
	Jupiter W.	44 14 9	2268	46 0 56	2264	47 47 48	2262	49 34 44	2260
	α Aquilæ E.	57 59 44	2617	56 27 47	2642	54 56 22	2669	53 25 31	2690
8	Saturn W.	80 33 1	2282	82 19 27	2282	84 5 53	2282	85 52 18	2283
	Spica W.	59 38 2	2268	61 24 48	2270	63 11 32	2271	64 58 14	2272
	Jupiter W.	58 30 6	2263	60 17 15	2263	62 4 24	2263	63 51 33	2262
	α Aquilæ E.	46 3 2	2321	44 37 30	2302	43 13 21	2309	41 50 29	2342
	Sun E.	117 8 19	2691	115 29 11	2691	113 50 3	2691	112 10 56	2692
9	Saturn W.	94 44 0	2291	96 30 12	2294	98 16 21	2296	100 2 27	2296
	Spica W.	73 51 20	2279	75 37 50	2281	77 24 17	2283	79 10 41	2285
	Jupiter W.	72 47 11	2267	74 34 14	2269	76 21 14	2261	78 8 11	2264
	Antares W.	28 39 24	2334	30 24 34	2330	32 9 50	2327	33 55 10	2326
	Sun E.	103 55 40	2699	102 16 43	2690	100 37 48	2692	98 58 56	2695
10	Saturn W.	108 51 51	2315	110 37 28	2320	112 23 0	2324	114 8 25	2328
	Spica W.	88 1 51	2298	89 47 53	2302	91 33 50	2305	93 9 42	2308
	Jupiter W.	87 2 4	2276	88 48 39	2279	90 35 10	2282	92 21 36	2285
	Antares W.	42 42 11	2325	44 27 34	2326	46 12 55	2328	47 58 13	2331
	Sun E.	90 45 28	2618	89 6 58	2621	87 28 32	2625	85 50 11	2628

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
11	Spica W.	95° 5' 30"	2311	96° 51' 13"	2315	98° 36' 50"	2319	100° 22' 22"	2323
	Jupiter W.	94 7 58	2298	95 54 15	2292	97 40 26	2296	99 26 31	2299
	Antares W.	49 43 28	2332	51 28 41	2335	53 13 50	2337	54 58 55	2340
	SUN E.	84 11 54	2632	82 33 42	2635	80 55 35	2640	79 17 34	2643
12	Jupiter W.	108 15 33	2320	110 1 3	2325	111 46 26	2331	113 31 40	2337
	Antares W.	63 43 14	2357	65 27 51	2361	67 12 22	2365	68 56 47	2368
	SUN E.	71 8 50	2665	69 31 23	2669	67 54 2	2675	66 16 48	2680
13	Antares W.	77 37 19	2392	79 21 5	2397	81 4 44	2403	82 48 15	2408
	α Aquilæ W.	33 58 46	4179	35 7 32	4036	36 18 36	3907	37 31 49	3793
	SUN E.	58 12 23	2707	56 35 52	2713	54 59 29	2719	53 23 15	2725
	Aldebaran E.	103 16 28	2396	101 32 51	2403	99 49 21	2409	98 5 59	2415
14	Antares W.	91 23 51	2437	93 6 33	2443	94 49 6	2450	96 31 30	2456
	α Aquilæ W.	44 2 48	3413	45 24 50	3363	46 47 49	3319	48 11 39	3279
	SUN E.	45 24 14	2760	43 48 54	2766	42 13 44	2776	40 38 45	2784
	Aldebaran E.	89 31 7	2443	87 48 34	2450	86 6 10	2456	84 23 55	2462
	Mars E.	102 43 25	2626	101 5 5	2632	99 26 53	2638	97 48 49	2644
15	α Aquilæ W.	55 20 47	3143	56 48 5	3124	58 15 45	3109	59 43 44	3096
	SUN E.	32 46 36	2630	31 12 47	2641	29 39 12	2652	28 5 51	2663
	Aldebaran E.	75 55 8	2499	74 13 54	2507	72 32 51	2516	70 52 0	2525
	Mars E.	89 40 57	2683	88 3 54	2691	86 27 2	2699	84 50 21	2707
19	Mars E.	39 40 56	3022	38 11 10	3034	36 41 40	3047	35 12 25	3060
	Pollux E.	66 8 49	2976	64 35 59	2989	63 3 26	2992	61 31 10	2916
	Regulus E.	102 47 22	2811	101 13 9	2823	99 39 11	2834	98 5 27	2845
20	SUN W.	27 42 30	3264	29 7 24	3772	30 32 8	3281	31 56 42	3290
	Pollux E.	53 54 12	2987	52 23 43	3001	50 53 32	3017	49 23 40	3022
	Regulus E.	90 20 11	2897	88 47 48	2907	87 15 38	2917	85 43 41	2927
21	SUN W.	38 56 57	3333	40 20 30	3342	41 43 53	3350	43 7 7	3358
	Pollux E.	41 59 21	3119	40 31 34	3138	39 4 10	3156	37 37 11	3179
	Regulus E.	78 7 3	2975	76 36 19	2984	75 5 46	2998	73 35 25	3001
	Saturn E.	110 13 54	2972	108 43 6	2980	107 12 28	2988	105 42 0	2996
22	SUN W.	50 1 4	3394	51 23 27	3400	52 45 43	3408	54 7 51	3413
	Venus W.	18 43 13	3471	20 4 10	3478	21 24 59	3485	22 45 40	3491
	Pollux E.	30 29 17	3315	29 5 23	3322	27 42 12	3329	26 19 48	3439
	Regulus E.	66 6 11	3040	64 36 48	3047	63 7 34	3055	61 38 29	3061
	Saturn E.	98 11 59	3031	96 42 25	3036	95 12 57	3043	93 43 37	3048
	Jupiter E.	119 25 50	2994	117 55 30	3001	116 25 18	3006	114 55 13	3011
23	SUN W.	60 57 5	3436	62 18 41	3439	63 40 13	3443	65 1 41	3445
	Venus W.	29 27 30	3516	30 47 36	3520	32 7 38	3523	33 27 37	3525
	Aldebaran W.	25 59 40	3153	27 26 45	3148	28 53 56	3143	30 21 13	3139
	Regulus E.	54 14 55	3088	52 46 31	3094	51 18 14	3098	49 50 2	3102
	Saturn E.	86 18 33	3072	84 49 49	3074	83 21 8	3078	81 52 32	3081
	Jupiter E.	107 26 14	3032	105 56 41	3034	104 27 11	3038	102 57 45	3040
	Spica E.	108 5 1	3058	106 36 0	3062	105 7 4	3065	103 38 12	3067
24	SUN W.	71 48 33	3450	73 9 53	3450	74 31 13	3449	75 52 34	3447
	Venus W.	40 6 56	3533	41 26 44	3537	42 46 33	3531	44 6 23	3530

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XV ^h .	P. L. of Dist.	XVIII ^h .	P. L. of Dist.	XXI ^h .	P. L. of Dist.
11	Spica W.	102° 7' 50"	2226	103° 53' 13"	2230	105° 38' 29"	2234	107° 23' 39"	2239
	Jupiter W.	101 12 32	2203	102 58 27	2208	104 44 15	2212	106 29 57	2216
	Antares W.	56 43 56	2243	58 28 53	2246	60 13 45	2250	61 58 32	2253
	SUN E.	77 39 38	2647	76 1 47	2652	74 24 2	2656	72 46 23	2660
12	Jupiter W.	115 16 46	2241	117 1 46	2246	118 46 38	2252	120 31 22	2257
	Antares W.	70 41 7	2273	72 25 20	2278	74 9 27	2282	75 53 27	2286
	SUN E.	64 39 41	2684	63 2 40	2690	61 25 47	2696	59 49 1	2701
13	Antares W.	84 31 38	2413	86 14 54	2419	87 58 2	2425	89 41 1	2431
	α Aquilæ W.	38 46 58	2696	40 3 50	2612	41 22 11	2638	42 41 53	2472
	SUN E.	51 47 9	2732	50 11 11	2739	48 35 23	2746	46 59 44	2753
	Aldebaran E.	96 22 45	2419	94 39 38	2425	92 56 39	2431	91 13 49	2437
14	Antares W.	98 13 43	2464	99 55 47	2471	101 37 41	2478	103 19 25	2486
	α Aquilæ W.	49 36 15	2243	51 1 33	2213	52 27 27	2186	53 53 53	2163
	SUN E.	39 3 56	2792	37 29 18	2801	35 54 52	2811	34 20 38	2820
	Aldebaran E.	82 41 49	2470	80 59 53	2477	79 18 7	2485	77 36 32	2492
	Mars E.	96 10 54	2662	94 33 9	2690	92 55 35	2697	91 18 11	2675
15	α Aquilæ W.	61 11 58	2696	62 40 25	2678	64 9 4	2690	65 37 51	2663
	SUN E.	26 32 45	2877	24 59 57	2891	23 27 26	2906	21 55 14	2920
	Aldebaran E.	69 11 21	2633	67 30 53	2641	65 50 37	2651	64 10 34	2660
	Mars E.	83 13 51	2716	81 37 33	2725	80 1 26	2734	78 25 31	2743
19	Mars E.	33 43 26	2673	32 14 44	2687	30 46 19	2701	29 18 10	2714
	Pollux E.	59 59 11	2630	57 27 30	2643	56 56 6	2660	55 25 0	2672
	Regulus E.	96 31 57	2656	94 58 40	2666	93 25 37	2676	91 52 47	2687
20	SUN W.	33 21 5	2399	34 45 18	2307	36 9 21	2316	37 33 14	2325
	Pollux E.	47 54 7	2648	46 24 54	2656	44 56 2	2692	43 27 31	2700
	Regulus E.	84 11 56	2637	82 40 24	2647	81 9 5	2697	79 37 58	2696
21	SUN W.	44 30 12	2366	45 53 8	2373	47 15 55	2380	48 38 34	2388
	Pollux E.	36 10 37	2303	34 44 31	2327	33 18 54	2353	31 53 48	2363
	Regulus E.	72 5 14	2609	70 35 13	2618	69 5 22	2626	67 35 42	2634
	Saturn E.	104 11 42	2604	103 41 34	2610	102 11 34	2617	100 41 42	2624
22	SUN W.	55 29 53	2418	56 51 49	2428	58 13 39	2438	59 35 24	2441
	Venus W.	24 6 14	2497	25 26 42	2502	26 47 4	2507	28 7 20	2513
	Pollux E.	24 58 16	2496	23 37 46	2563	22 18 20	2621	21 0 18	2713
	Regulus E.	60 9 32	2696	58 40 41	2673	57 11 59	2679	55 43 24	2684
	Saturn E.	92 14 24	2653	90 45 17	2666	89 16 16	2664	87 47 22	2668
	Jupiter E.	113 25 14	2616	111 55 21	2620	110 25 33	2626	108 55 51	2629
23	SUN W.	66 23 7	2446	67 44 31	2448	69 5 53	2449	70 27 14	2451
	Venus W.	34 47 33	2528	36 7 26	2580	37 27 17	2631	38 47 7	2632
	Aldebaran W.	31 48 35	2136	33 16 2	2132	34 43 33	2120	36 11 8	2124
	Regulus E.	48 21 55	2106	46 53 52	2110	45 25 54	2113	43 58 0	2116
	Saturn E.	80 23 59	2683	78 55 29	2686	77 27 1	2687	75 58 36	2689
	Jupiter E.	101 28 22	2642	99 59 1	2643	98 29 42	2645	97 0 25	2646
	Spica E.	102 9 22	2670	100 40 36	2671	99 11 51	2672	97 43 7	2673
24	SUN W.	77 13 58	2445	78 35 23	2443	79 56 50	2440	81 18 21	2437
	Venus W.	45 26 14	2528	46 46 7	2526	48 6 2	2524	49 26 0	2519

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
24	Aldebaran W.	37° 38' 48"	3122	39° 6' 31"	3119	40° 34' 18"	3116	42° 2' 8"	3112
	Mars W.	18 17 32	3363	19 40 31	3367	21 3 37	3360	22 26 51	3344
	Regulus E.	42 30 10	3119	41 2 23	3121	39 34 39	3124	38 6 59	3127
	Saturn E.	74 30 13	3090	73 1 51	3090	71 33 29	3091	70 5 8	3090
	Jupiter E.	95 31 8	3045	94 1 51	3045	92 32 35	3045	91 3 18	3043
	Spica E.	96 14 24	3073	94 45 41	3073	93 16 59	3073	91 48 16	3073
25	SUN W.	82 39 56	3433	84 1 35	3439	85 23 19	3424	86 45 9	3418
	Venus W.	50 46 3	3516	52 6 10	3512	53 26 21	3506	54 46 38	3500
	Aldebaran W.	49 22 33	3090	50 50 55	3085	52 19 23	3079	53 47 58	3073
	Mars W.	29 24 50	3313	30 48 47	3306	32 12 51	3300	33 37 3	3294
	Regulus E.	30 49 25	3143	29 22 6	3147	27 54 53	3151	26 27 45	3156
	Saturn E.	62 43 7	3063	61 14 37	3060	59 46 3	3078	58 17 26	3074
	Jupiter E.	83 36 21	3032	82 6 48	3028	80 37 10	3024	79 7 27	3019
	Spica E.	84 24 10	3059	82 55 10	3055	81 26 5	3051	79 56 55	3045
26	SUN W.	93 36 4	3383	94 58 40	3374	96 21 26	3365	97 44 22	3356
	Venus W.	61 29 48	3456	62 50 50	3457	64 12 2	3447	65 33 25	3438
	Aldebaran W.	61 12 56	3097	62 42 23	3093	63 12 1	3019	64 41 50	3010
	Mars W.	40 40 6	3254	42 5 11	3246	43 30 26	3236	44 55 53	3226
	Pollux W.	21 14 11	3373	22 33 15	3368	23 53 36	3359	25 15 8	3354
	Saturn E.	50 53 13	3044	49 24 7	3048	47 54 54	3044	46 25 36	3039
	Jupiter E.	71 37 14	2989	70 6 48	2982	68 36 13	2975	67 5 29	2966
	Spica E.	72 29 20	3013	70 59 23	3006	69 29 18	2998	67 59 3	2989
27	SUN W.	104 41 58	3302	106 6 7	3299	107 30 31	3276	108 55 10	3263
	Aldebaran W.	73 13 56	2968	74 45 1	2946	76 16 21	2935	77 47 56	2923
	Venus W.	72 23 13	3383	73 45 49	3371	75 8 39	3358	76 31 44	3344
	Mars W.	52 6 10	3172	53 32 53	3169	54 59 51	3147	56 27 4	3133
	Pollux W.	32 16 33	3183	33 43 2	3154	35 10 6	3126	36 37 44	3099
	Saturn E.	38 57 30	3014	37 27 35	3010	35 57 35	3006	34 27 30	3000
	Jupiter E.	59 29 6	2921	57 57 14	2911	56 25 9	2900	54 52 50	2889
	Spica E.	60 24 53	2939	58 53 24	2929	57 21 42	2917	55 49 45	2905
28	SUN W.	116 2 26	3193	117 28 44	3178	118 55 20	3162	120 22 15	3146
	Aldebaran W.	85 29 52	2857	87 3 6	2843	88 36 39	2828	90 10 31	2812
	Venus W.	83 31 11	3272	84 55 55	3256	86 20 58	3241	87 46 19	3225
	Mars W.	63 47 14	3064	65 16 8	3048	66 45 21	3034	68 14 52	3019
	Pollux W.	44 3 38	2981	45 34 15	2969	47 5 19	2959	48 36 49	2948
	Jupiter E.	47 7 44	2883	45 33 59	2821	43 59 58	2809	42 25 42	2797
	Spica E.	48 6 1	2842	46 32 27	2826	44 58 33	2813	43 24 21	2798
	Antares E.	93 34 50	2882	92 1 29	2837	90 27 49	2823	88 53 50	2808
29	Aldebaran W.	98 4 42	2738	99 40 32	2723	101 16 43	2708	102 53 15	2699
	Venus W.	94 57 56	3143	96 25 14	3123	97 52 56	3104	99 21 1	3087
	Mars W.	75 47 20	2638	77 18 51	2621	78 50 43	2604	80 22 57	2587
	Pollux W.	56 20 48	2618	57 54 52	2708	59 29 22	2779	61 4 17	2760
	Jupiter E.	34 30 30	2740	32 54 43	2733	31 18 45	2723	29 42 34	2713
	Spica E.	35 28 34	2733	33 52 25	2708	32 15 56	2692	30 39 6	2677
	Antares E.	80 59 5	2732	79 23 8	2716	77 46 50	2700	76 10 10	2684
30	Venus W.	106 46 44	2698	108 16 59	2680	109 47 37	2662	111 18 37	2644
	Mars W.	88 9 33	2801	89 43 59	2785	91 18 47	2767	92 53 58	2750
	Pollux W.	69 5 3	2667	70 42 27	2649	72 20 15	2633	73 58 27	2606
	Antares E.	68 1 30	2604	66 22 40	2588	64 43 28	2572	63 3 55	2556

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
24	Aldebaran W.	43° 30' 3"	3108	44° 58' 3"	3104	46° 26' 8"	3100	47° 54' 18"	3096
	Mars W.	23 50 12	3336	25 13 42	3331	26 37 18	3325	28 1 1	3319
	Regulus E.	36 39 22	3129	35 11 47	3132	33 44 16	3135	32 16 49	3138
	Saturn E.	68 36 46	3069	67 8 23	3068	65 39 59	3067	64 11 34	3066
	Jupiter E.	89 33 59	3043	88 4 38	3040	86 35 15	3039	85 5 50	3036
	Spica E.	90 19 32	3070	88 50 46	3069	87 21 58	3065	85 53 6	3062
25	SUN W.	88 7 5	3413	89 29 8	3406	90 51 18	3399	92 13 36	3390
	Venus W.	56 7 2	3495	57 27 32	3488	58 48 9	3481	60 8 54	3473
	Aldebaran W.	55 16 41	3067	56 45 31	3060	58 14 30	3052	59 43 38	3044
	Mars W.	35 1 22	3286	36 25 50	3279	37 50 26	3271	39 15 11	3263
	Regulus E.	25 0 42	3164	23 33 51	3176	22 7 15	3188	20 40 51	3203
	Saturn E.	56 48 45	3071	55 20 0	3065	53 51 9	3063	52 22 14	3058
	Jupiter E.	77 37 38	3014	76 7 42	3009	74 37 40	3003	73 7 31	2997
	Spica E.	78 27 38	3039	76 58 14	3034	75 28 44	3028	73 59 6	3022
26	SUN W.	99 7 29	3345	100 30 48	3335	101 54 19	3325	103 18 2	3313
	Venus W.	66 54 59	3438	68 16 44	3417	69 38 41	3407	71 0 50	3394
	Aldebaran W.	67 11 50	3001	68 42 2	2990	70 12 27	2980	71 43 5	2969
	Mars W.	46 21 31	3215	47 47 22	3205	49 13 25	3194	50 39 41	3183
	Pollux W.	26 37 43	3335	28 1 14	3291	29 25 36	3283	30 50 43	3216
	Saturn E.	44 56 12	3034	43 26 41	3029	41 57 4	3023	40 27 20	3018
	Jupiter E.	65 34 34	2958	64 3 29	2950	62 32 13	2941	61 0 46	2931
	Spica E.	66 28 37	2980	64 57 59	2971	63 27 10	2961	61 56 8	2950
	SUN W.	110 20 5	3250	111 45 15	3236	113 10 42	3222	114 36 25	3207
	Aldebaran W.	79 19 46	2910	80 51 52	2897	82 24 15	2883	83 56 55	2870
27	Venus W.	77 55 5	3331	79 18 41	3316	80 42 34	3301	82 6 44	3287
	Mars W.	57 54 33	3120	59 22 18	3107	60 50 19	3092	62 18 38	3078
	Pollux W.	38 5 55	3073	39 34 37	3049	41 3 49	3026	42 33 30	3004
	Saturn E.	32 57 21	3001	31 27 10	3002	29 57 0	3003	28 26 50	3004
	Jupiter E.	53 20 17	2877	51 47 29	2867	50 14 30	2856	48 41 15	2844
	Spica E.	54 17 32	2893	52 45 4	2880	51 12 20	2867	49 39 19	2854
	SUN W.	121 49 29	3130	123 17 2	3114	124 44 54	3098	126 13 6	3079
	Aldebaran W.	91 44 43	2798	93 19 14	2783	94 54 4	2769	96 29 13	2753
28	Venus W.	89 11 59	3208	90 37 59	3191	92 4 19	3174	93 30 59	3160
	Mars W.	69 44 41	3003	71 14 50	2987	72 45 19	2970	74 16 9	2954
	Pollux W.	50 8 45	2898	51 41 7	2877	53 13 55	2857	54 47 9	2838
	Jupiter E.	40 51 10	2785	39 16 23	2774	37 41 21	2762	36 6 3	2750
	Spica E.	41 49 50	2784	40 15 1	2769	38 39 52	2753	37 4 23	2738
	Antares E.	87 19 32	2793	85 44 55	2779	84 9 59	2763	82 34 42	2747
	SUN W.	104 30 9	2874	106 7 24	2858	107 45 0	2842	109 22 58	2826
	Venus W.	100 49 26	3070	102 18 12	3052	103 47 20	3034	105 16 51	3016
29	Mars W.	81 55 32	2870	83 28 29	2853	85 1 48	2836	86 35 29	2818
	Pollux W.	62 39 37	2743	64 15 21	2733	65 51 30	2704	67 28 4	2678
	Jupiter E.	28 6 11	2706	26 29 39	2703	24 53 3	2700	23 16 23	2699
	Spica E.	29 1 55	2651	27 24 23	2646	25 46 31	2631	24 8 18	2615
	Antares E.	74 33 9	2660	72 55 47	2652	71 18 3	2636	69 39 57	2621
	SUN W.	112 50 0	2927	114 21 45	2909	115 53 53	2891	117 26 24	2872
30	Mars W.	94 29 32	2733	96 5 28	2717	97 41 47	2699	99 18 28	2681
	Pollux W.	75 37 2	2615	77 16 2	2679	78 55 26	2662	80 35 13	2645
	Antares E.	61 24 0	2640	59 43 43	2625	58 3 4	2609	56 22 3	2594

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semidiameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
Fri.	1	^h 2 ^m 32 ^s 40.35	9.531	N.15° 0' 35.5	45.50	15' 54".24	66.03	^m 2 59.97	^s 0.325
Sat.	2	2 36 29.35	9.553	15 18 40.0	44.88	15 54.01	66.11	3 7.51	0.303
Sun.	3	2 40 18.89	9.576	15 36 29.3	44.24	15 53.78	66.19	3 14.51	0.280
Mon.	4	2 44 8.98	9.599	15 54 3.2	43.59	15 53.55	66.27	3 20.96	0.257
Tues.	5	2 47 59.63	9.623	16 11 21.5	42.93	15 53.32	66.35	3 26.84	0.233
Wed.	6	2 51 50.84	9.647	16 28 23.8	42.26	15 53.09	66.43	3 32.16	0.210
Thur.	7	2 55 42.63	9.671	16 45 9.7	41.57	15 52.86	66.51	3 36.91	0.186
Fri.	8	2 59 35.02	9.695	17 1 38.9	40.87	15 52.63	66.59	3 41.07	0.161
Sat.	9	3 3 27.99	9.720	17 17 51.2	40.16	15 52.41	66.67	3 44.64	0.136
Sun.	10	3 7 21.56	9.745	17 33 46.4	39.43	15 52.19	66.76	3 47.62	0.111
Mon.	11	3 11 15.72	9.770	17 49 24.0	38.69	15 51.97	66.85	3 50.01	0.087
Tues.	12	3 15 10.48	9.794	18 4 43.7	37.94	15 51.76	66.93	3 51.80	0.062
Wed.	13	3 19 5.83	9.819	18 19 45.2	37.18	15 51.55	67.01	3 52.99	0.038
Thur.	14	3 23 1.78	9.843	18 34 28.5	36.41	15 51.34	67.09	3 53.60	0.013
Fri.	15	3 26 58.32	9.868	18 48 53.2	35.62	15 51.14	67.17	3 53.61	0.011
Sat.	16	3 30 55.44	9.892	19 2 58.7	34.82	15 50.94	67.25	3 53.05	0.035
Sun.	17	3 34 53.13	9.916	19 16 44.8	34.01	15 50.75	67.33	3 51.92	0.059
Mon.	18	3 38 51.39	9.939	19 30 11.3	33.19	15 50.56	67.41	3 50.22	0.083
Tues.	19	3 42 50.21	9.962	19 43 18.0	32.36	15 50.38	67.49	3 47.95	0.106
Wed.	20	3 46 49.59	9.984	19 56 4.6	31.51	15 50.20	67.57	3 45.13	0.129
Thur.	21	3 50 49.51	10.006	20 8 30.9	30.66	15 50.03	67.65	3 41.78	0.151
Fri.	22	3 54 49.94	10.028	20 20 36.5	29.79	15 49.86	67.73	3 37.92	0.172
Sat.	23	3 58 50.87	10.049	20 32 21.3	28.92	15 49.70	67.80	3 33.55	0.193
Sun.	24	4 2 52.32	10.070	20 43 45.0	28.03	15 49.54	67.87	3 28.67	0.214
Mon.	25	4 6 54.28	10.091	20 54 47.3	27.14	15 49.38	67.94	3 23.28	0.234
Tues.	26	4 10 56.72	10.111	21 5 28.0	26.23	15 49.23	68.01	3 17.41	0.254
Wed.	27	4 14 59.63	10.131	21 15 46.8	25.32	15 49.08	68.08	3 11.08	0.274
Thur.	28	4 19 2.99	10.150	21 25 43.6	24.40	15 48.93	68.15	3 4.29	0.293
Fri.	29	4 23 6.80	10.168	21 35 18.3	23.48	15 48.78	68.22	2 57.05	0.312
Sat.	30	4 27 11.06	10.186	21 44 30.6	22.54	15 48.63	68.28	2 49.37	0.330
Sun.	31	4 31 15.75	10.203	21 53 20.2	21.59	15 48.49	68.34	2 41.26	0.347
Mon.	32	4 35 20.85	10.220	N.22 1 47.1	20.63	15 48.35	68.40	2 32.73	0.364

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		^h ^m ^s	^s	N. [°] ['] ["]	["]	^m ^s	^s	^h ^m ^s
Fri.	1	2 32 40.82	9.531	N.15 0 37.8	45.50	2 59.99	0.325	2 35 40.81
Sat.	2	2 36 29.83	9.553	15 18 42.4	44.88	3 7.53	0.303	2 39 37.36
Sun.	3	2 40 19.40	9.576	15 36 31.8	44 24	3 14.52	0.280	2 43 33.92
Mon.	4	2 44 9.51	9.599	15 54 5.8	43.59	3 20.97	0.257	2 47 30.48
Tues.	5	2 48 0.18	9.623	16 11 24.0	42.93	3 26.85	0.233	2 51 27.03
Wed.	6	2 51 51.41	9.647	16 28 26.3	42.26	3 32.17	0.210	2 55 23.58
Thur.	7	2 55 43.22	9.671	16 45 12.2	41.57	3 36.92	0.186	2 59 20.14
Fri.	8	2 59 35.62	9.695	17 1 41.4	40.87	3 41.08	0.161	3 3 16.70
Sat.	9	3 3 28.60	9.720	17 17 53.7	40.16	3 44.65	0.136	3 7 13.25
Sun.	10	3 7 22.18	9.745	17 33 48.9	39.43	3 47.63	0.111	3 11 9.81
Mon.	11	3 11 16.35	9.770	17 49 26.6	38.69	3 50.01	0.087	3 15 6.36
Tues.	12	3 15 11.12	9.794	18 4 46.2	37.94	3 51.80	0.062	3 19 2.92
Wed.	13	3 19 6.48	9.819	18 19 47.7	37.18	3 52.99	0.038	3 22 59.47
Thur.	14	3 23 2.43	9.843	18 34 30.9	36.41	3 53.60	0.013	3 26 56.03
Fri.	15	3 26 58.97	9.868	18 48 55.5	35.62	3 53.61	0.011	3 30 52.58
Sat.	16	3 30 56.09	9.892	19 3 1.0	34.82	3 53.05	0.035	3 34 49.14
Sun.	17	3 34 53.78	9.916	19 16 47.1	34.01	3 51.92	0.059	3 38 45.70
Mon.	18	3 38 52.04	9.939	19 30 13.5	33.19	3 50.22	0.083	3 42 42.26
Tues.	19	3 42 50.85	9.962	19 43 20.1	32.36	3 47.96	0.106	3 46 38.81
Wed.	20	3 46 50.22	9.984	19 56 6.6	31.51	3 45.14	0.129	3 50 35.36
Thur.	21	3 50 50.13	10.006	20 8 32.8	30.66	3 41.79	0.151	3 54 31.92
Fri.	22	3 54 50.55	10.028	20 20 38.3	29.79	3 37.93	0.172	3 58 28.48
Sat.	23	3 58 51.47	10.049	20 32 23.0	28.92	3 33.56	0.193	4 2 25.03
Sun.	24	4 2 52.91	10.070	20 43 46.6	28.03	3 28.68	0.214	4 6 21.59
Mon.	25	4 6 54.85	10.091	20 54 48.9	27.14	3 23.29	0.234	4 10 18.14
Tues.	26	4 10 57.28	10.111	21 5 29.5	26.23	3 17.42	0.254	4 14 14.70
Wed.	27	4 15 0.17	10.131	21 15 48.2	25.32	3 11.09	0.274	4 18 11.26
Thur.	28	4 19 3.51	10.150	21 25 44.9	24.40	3 4.30	0.293	4 22 7.81
Fri.	29	4 23 7.30	10.168	21 35 19.5	23.48	2 57.07	0.312	4 26 4.37
Sat.	30	4 27 11.54	10.186	21 44 31.7	22.54	2 49.39	0.330	4 30 0.93
Sun.	31	4 31 16.21	10.203	21 53 21.3	21.59	2 41.27	0.347	4 33 57.48
Mon.	32	4 35 21.29	10.220	N.22 1 48.1	20.63	2 32.74	0.364	4 37 54.03

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	121	40° 35' 54.0	35' 22.4	145.40	—0.67	0.0035155	44.3	21 20 48.79	
2	122	41 34 2.5	33 30.8	145.32	0.58	.0036217	44.0	21 16 52.88	
3	123	42 32 9.3	31 37.5	145.25	0.46	.0037275	43.8	21 12 56.97	
4	124	43 30 14.4	29 42.5	145.18	0.33	.0038328	43.6	21 9 1.06	
5	125	44 28 17.9	27 45.8	145.11	0.18	.0039376	43.4	21 5 5.15	
6	126	45 26 19.9	25 47.7	145.04	—0.05	.0040416	43.1	21 1 9.24	
7	127	46 24 20.4	23 48.1	144.98	+0.08	.0041449	42.8	20 57 13.33	
8	128	47 22 19.5	21 47.1	144.92	0.19	.0042472	42.4	20 53 17.42	
9	129	48 20 17.3	19 44.7	144.88	0.28	.0043487	42.0	20 49 21.51	
10	130	49 18 13.8	17 41.0	144.83	0.33	.0044489	41.4	20 45 25.60	
11	131	50 16 9.1	15 36.2	144.79	0.38	.0045478	40.8	20 41 29.69	
12	132	51 14 3.1	13 30.1	144.74	0.38	.0046452	40.2	20 37 33.78	
13	133	52 11 55.9	11 22.8	144.69	0.34	.0047411	39.6	20 33 37.87	
14	134	53 9 47.5	9 14.2	144.64	0.30	.0048351	38.8	20 29 41.97	
15	135	54 7 37.8	7 4.3	144.58	0.21	.0049273	38.0	20 25 46.06	
16	136	55 5 26.9	4 53.3	144.52	+0.12	.0050176	37.2	20 21 50.15	
17	137	56 3 14.6	2 40.9	144.46	—0.01	.0051059	36.3	20 17 54.24	
18	138	57 1 0.9	0 27.1	144.40	0.14	.0051920	35.4	20 13 58.33	
19	139	57 58 45.8	58 11.8	144.34	0.25	.0052759	34.5	20 10 2.42	
20	140	58 56 29.2	55 55.0	144.28	0.36	.0053577	33.6	20 6 6.51	
21	141	59 54 11.1	53 36.8	144.21	0.47	.0054375	32.8	20 2 10.60	
22	142	60 51 51.5	51 17.1	144.15	0.57	.0055153	31.9	19 58 14.69	
23	143	61 49 30.4	48 55.8	144.09	0.66	.0055910	31.1	19 54 18.78	
24	144	62 47 7.9	46 33.1	144.03	0.70	.0056649	30.4	19 50 22.87	
25	145	63 44 43.9	44 8.9	143.97	0.70	.0057371	29.7	19 46 26.96	
26	146	64 42 18.5	41 43.4	143.91	0.69	.0058077	29.1	19 42 31.05	
27	147	65 39 51.6	39 16.4	143.85	0.64	.0058767	28.5	19 38 35.14	
28	148	66 37 23.3	36 47.9	143.80	0.56	.0059442	27.9	19 34 39.23	
29	149	67 34 53.8	34 18.2	143.75	0.47	.0060103	27.4	19 30 43.31	
30	150	68 32 23.1	31 47.3	143.70	0.35	.0060752	26.9	19 26 47.40	
31	151	69 29 51.2	29 15.3	143.65	0.21	.0061390	26.4	19 22 51.49	
32	152	70 27 18.2	26 42.2	143.60	—0.08	00.062017	25.9	19 18 55.58	

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	15 ['] 49.1 ["]	15 ['] 55.5 ["]	57 ['] 56.7 ["]	+2.01	58 ['] 20.3 ["]	+1.93	10 ^h 26.6 ^m	2.13 ^s	13.4
2	16 1.6	16 7.3	58 42.8	1.80	59 3.4	1.63	11 19.3	2.27	14.4
3	16 12.3	16 16.6	59 21.9	1.43	59 37.8	1.90	12 15.6	2.42	15.4
4	16 20.2	16 22.8	59 50.8	0.95	60 0.5	0.68	13 15.3	2.52	16.4
5	16 24.6	16 25.5	60 7.0	+0.40	60 10.1	+0.13	14 16.8	2.56	17.4
6	16 25.4	16 24.6	60 10.1	-0.14	60 6.9	-0.38	15 18.2	2.52	18.4
7	16 23.0	16 20.7	60 1.1	0.59	59 52.7	0.79	16 17.7	2.41	19.4
8	16 17.8	16 14.5	59 42.1	0.95	59 29.8	1.08	17 14.0	2.28	20.4
9	16 10.7	16 6.7	59 16.1	1.19	59 1.3	1.96	18 7.0	2.15	21.4
10	16 2.5	15 58.1	58 45.8	1.32	58 29.7	1.35	18 57.2	2.05	22.4
11	15 53.6	15 49.2	58 13.4	1.37	57 56.9	1.37	19 45.5	1.99	23.4
12	15 44.7	15 40.3	57 40.5	1.36	57 24.2	1.35	20 32.7	1.96	24.4
13	15 35.9	15 31.6	57 8.1	1.33	56 52.4	1.31	21 19.7	1.97	25.4
14	15 27.3	15 23.2	56 36.8	1.29	56 21.5	1.25	22 7.3	2.00	26.4
15	15 19.2	15 15.3	56 6.8	1.22	55 52.3	1.18	22 55.7	2.04	27.4
16	15 11.5	15 7.8	55 38.4	1.14	55 25.1	1.09	23 45.0	2.07	28.4
17	15 4.3	15 1.1	55 12.3	1.04	55 0.2	0.98	δ		29.4
18	14 58.0	14 55.2	54 48.9	0.90	54 38.6	0.82	0 35.0	2.08	0.8
19	14 52.6	14 50.4	54 29.3	0.72	54 21.3	0.61	1 24.9	2.06	1.8
20	14 48.7	14 47.3	54 14.6	0.49	54 9.6	0.34	2 14.0	2.02	2.8
21	14 46.4	14 46.0	54 6.4	-0.19	54 5.0	-0.03	3 1.9	1.96	3.8
22	14 46.2	14 47.0	54 5.7	+0.15	54 8.5	+0.33	3 48.2	1.90	4.8
23	14 48.4	14 50.4	54 13.7	0.53	54 21.2	0.73	4 32.9	1.84	5.8
24	14 53.1	14 56.5	54 31.2	0.93	54 43.6	1.14	5 16.5	1.81	6.8
25	15 0.6	15 5.3	54 58.4	1.34	55 15.7	1.53	5 59.6	1.80	7.8
26	15 10.6	15 16.5	55 35.2	1.72	55 56.9	1.89	6 43.0	1.83	8.8
27	15 22.9	15 29.8	56 20.5	2.04	56 45.8	2.16	7 27.6	1.91	9.8
28	15 37.0	15 44.5	57 12.4	2.25	57 39.9	2.30	8 14.5	2.02	10.8
29	15 52.1	15 59.6	58 7.7	2.31	58 35.3	2.27	9 4.6	2.17	11.8
30	16 6.9	16 13.8	59 2.1	2.17	59 27.5	2.02	9 58.8	2.35	12.8
31	16 20.2	16 25.7	59 50.7	1.82	60 11.2	1.57	10 57.2	2.50	13.8
32	16 30.4	16 34.1	60 28.3	+1.27	60 41.7	+0.94	11 59.0	2.61	14.8

GREENWICH MEAN TIME.

THE MOON'S LIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dec. for 1 m.	Declination.	Hour.	Right Ascension.	Dec. for 1 m.	Declination.	Hour.	Right Ascension.	Dec. for 1 m.	Declination.
FRIDAY 1.				SUNDAY 3.							
0	12 41 11.54	2.1308	S. 9 2 37.2	11.008	0	14 31 2.45	2.037	S. 17 15 41.4	8.441		
1	12 43 21.12	2.137	9 14 16.5	11.003	1	14 33 2.25	2.033	17 27 4.8	8.337		
2	12 45 31.04	2.147	9 25 53.4	11.007	2	14 35 54.7	2.039	17 35 21.9	8.233		
3	12 47 41.19	2.177	9 37 28.2	11.001	3	14 38 30.1	2.046	17 43 32.7	8.129		
4	12 49 51.64	2.176	9 49 0.7	11.022	4	14 40 47.39	2.052	17 51 37.0	8.018		
5	12 52 2.40	2.189	10 0 30.9	11.003	5	14 43 14.71	2.057	17 59 34.8	7.906		
6	12 54 13.45	2.173	10 11 56.7	11.043	6	14 45 42.16	2.062	18 7 26.0	7.797		
7	12 56 24.57	2.159	10 23 24.1	11.001	7	14 48 9.93	2.066	18 15 10.5	7.686		
8	12 58 35.57	2.17	10 34 46.9	11.009	8	14 50 36.03	2.070	18 22 48.3	7.573		
9	13 0 46.39	2.160	10 46 7.0	11.014	9	14 53 6.45	2.074	18 30 19.2	7.457		
10	13 3 0.93	2.164	10 57 24.4	11.007	10	14 55 35.20	2.077	18 37 43.1	7.340		
11	13 5 13.76	2.170	11 8 39.1	11.021	11	14 58 4.26	2.080	18 45 0.0	7.222		
12	13 7 26.39	2.170	11 19 50.9	11.013	12	15 0 33.63	2.083	18 52 9.8	7.103		
13	13 9 39.92	2.157	11 30 38.7	11.011	13	15 3 3.31	2.073	18 59 12.4	6.982		
14	13 11 53.55	2.162	11 42 5.5	11.079	14	15 5 33.30	2.064	19 6 7.7	6.861		
15	13 14 7.53	2.167	11 53 8.1	11.077	15	15 8 3.69	2.073	19 12 55.7	6.736		
16	13 16 21.54	2.163	12 4 7.5	11.063	16	15 10 34.19	2.123	19 19 36.2	6.613		
17	13 18 36.49	2.179	12 15 3.6	11.07	17	15 13 5.07	2.173	19 26 9.2	6.487		
18	13 20 51.45	2.186	12 25 56.3	11.009	18	15 15 36.36	2.171	19 32 34.6	6.360		
19	13 23 6.40	2.192	12 36 45.6	11.002	19	15 18 7.73	2.166	19 38 52.4	6.233		
20	13 25 22.46	2.186	12 47 31.3	11.071	20	15 20 39.48	2.153	19 45 2.5	6.102		
21	13 27 36.46	2.186	12 58 13.3	11.009	21	15 23 11.51	2.161	19 51 4.7	5.971		
22	13 29 54.50	2.172	13 8 51.6	11.006	22	15 25 43.51	2.166	19 56 59.0	5.839		
23	13 32 11.49	2.151	S. 13 19 26.1	11.041	23	15 28 16.38	2.160	S. 20 2 45.4	5.706		
SATURDAY 2.				MONDAY 4.							
0	13 34 26.53	2.160	S. 13 29 56.6	11.073	0	15 30 49.21	2.164	S. 20 8 23.8	5.573		
1	13 36 45.91	2.166	13 40 23.1	11.005	1	15 33 22.30	2.167	20 13 54.0	5.436		
2	13 39 3.64	2.164	13 50 45.6	11.049	2	15 35 55.65	2.172	20 19 16.1	5.300		
3	13 41 21.72	2.163	14 1 3.9	11.009	3	15 38 24.24	2.169	20 24 30.0	5.163		
4	13 43 40.15	2.161	14 11 17.9	11.077	4	15 41 3.06	2.160	20 29 35.6	5.023		
5	13 45 56.23	2.119	14 21 27.5	11.123	5	15 43 37.16	2.160	20 34 32.8	4.883		
6	13 48 15.06	2.126	14 31 32.7	11.045	6	15 46 11.46	2.176	20 39 21.6	4.743		
7	13 50 37.54	2.126	14 41 33.3	11.073	7	15 48 45.99	2.173	20 44 1.9	4.601		
8	13 52 57.37	2.135	14 51 29.3	11.004	8	15 51 30.73	2.167	20 48 33.7	4.466		
9	13 55 17.56	2.164	15 1 20.6	11.073	9	15 53 55.78	2.163	20 52 56.9	4.314		
10	13 57 38.10	2.163	15 11 7.1	11.073	10	15 56 30.55	2.167	20 57 11.4	4.170		
11	13 59 56.29	2.161	15 20 48.6	11.001	11	15 59 6.22	2.161	21 1 17.3	4.025		
12	14 2 20.23	2.160	15 30 25.2	11.077	12	16 1 41.78	2.163	21 5 14.4	3.879		
13	14 4 41.22	2.166	15 39 56.7	11.001	13	16 4 17.53	2.167	21 9 2.7	3.731		
14	14 7 3.77	2.162	15 49 33.0	11.073	14	16 6 53.46	2.160	21 12 42.1	3.583		
15	14 9 26.07	2.176	15 58 44.0	11.006	15	16 9 29.56	2.161	21 16 12.7	3.436		
16	14 11 48.72	2.164	16 7 39.7	11.116	16	16 12 5.83	2.166	21 19 34.3	3.286		
17	14 14 11.72	2.162	16 17 9.9	11.071	17	16 14 42.36	2.164	21 22 46.9	3.136		
18	14 16 35.07	2.162	16 26 14.6	11.001	18	16 17 18.24	2.160	21 25 50.5	2.984		
19	14 18 58.78	2.160	16 35 13.7	11.076	19	16 19 55.57	2.153	21 28 45.0	2.832		
20	14 21 22.53	2.167	16 44 7.0	11.006	20	16 22 32.44	2.156	21 31 30.4	2.680		
21	14 23 47.22	2.164	16 52 54.5	11.073	21	16 25 9.44	2.177	21 34 6.6	2.527		
22	14 26 11.46	2.162	17 1 30.1	11.041	22	16 27 46.56	2.157	21 36 33.7	2.375		
23	14 28 35.65	2.170	17 10 11.8	11.041	23	16 30 23.80	2.166	21 38 51.6	2.221		
24	14 31 2.45	2.167	S. 17 18 41.4	11.041	24	16 33 1.15	2.163	S. 21 41 0.2	2.066		

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 5.					THURSDAY 7.				
0	16 33 1.15	2.6233	S. 21° 41' 0.2	2.066	0	18 38 31.98	2.5663	S. 20° 21' 29.8	5.343
1	16 35 38.60	2.6249	21 42 59.5	1.912	1	18 41 5.48	2.5663	20 16 11.1	5.380
2	16 38 16.14	2.6264	21 44 49.6	1.787	2	18 43 38.74	2.5623	20 10 44.2	5.517
3	16 40 53.77	2.6278	21 46 30.3	1.601	3	18 46 11.76	2.5482	20 5 9.1	5.652
4	16 43 31.48	2.6291	21 48 1.7	1.445	4	18 48 44.52	2.5439	19 59 26.0	5.786
5	16 46 9.26	2.6302	21 49 23.7	1.288	5	18 51 17.03	2.5397	19 53 34.9	5.918
6	16 48 47.10	2.6312	21 50 36.3	1.132	6	18 53 49.29	2.5354	19 47 35.8	6.051
7	16 51 25.00	2.6321	21 51 39.6	0.977	7	18 56 21.28	2.5310	19 41 28.8	6.182
8	16 54 2.95	2.6328	21 52 33.5	0.819	8	18 58 53.01	2.5266	19 35 13.9	6.312
9	16 56 40.94	2.6334	21 53 17.9	0.662	9	19 1 24.47	2.5220	19 28 51.3	6.440
10	16 59 18.96	2.6338	21 53 52.9	0.505	10	19 3 55.65	2.5173	19 22 21.1	6.567
11	17 1 57.00	2.6341	21 54 18.5	0.348	11	19 6 26.55	2.5127	19 15 43.3	6.698
12	17 4 35.05	2.6343	21 54 34.7	0.191	12	19 8 57.18	2.5081	19 8 58.0	6.818
13	17 7 13.11	2.6344	21 54 41.4	0.033	13	19 11 27.52	2.5033	19 2 5.2	6.942
14	17 9 51.18	2.6344	21 54 38.6	0.126	14	19 13 57.58	2.4986	18 55 5.0	7.064
15	17 12 29.24	2.6342	21 54 26.4	0.282	15	19 16 27.35	2.4937	18 47 57.5	7.185
16	17 15 7.28	2.6338	21 54 4.8	0.439	16	19 18 56.82	2.4887	18 40 42.8	7.304
17	17 17 45.30	2.6334	21 53 33.7	0.597	17	19 21 26.00	2.4838	18 33 21.0	7.422
18	17 20 23.29	2.6328	21 52 53.2	0.764	18	19 23 54.88	2.4789	18 25 52.0	7.541
19	17 23 1.23	2.6320	21 52 3.2	0.911	19	19 26 23.47	2.4740	18 18 16.1	7.657
20	17 25 39.13	2.6312	21 51 3.9	1.067	20	19 28 51.75	2.4689	18 10 33.2	7.771
21	17 28 16.98	2.6302	21 49 55.2	1.223	21	19 31 19.73	2.4638	18 2 43.5	7.884
22	17 30 54.76	2.6291	21 48 37.1	1.380	22	19 33 47.41	2.4587	17 54 47.1	7.996
23	17 33 32.47	2.6279	S. 21° 47' 9.6	1.536	23	19 36 14.78	2.4536	S. 17° 46' 44.0	8.107
WEDNESDAY 6.					FRIDAY 8.				
0	17 36 10.11	2.6266	S. 21° 45' 32.8	1.691	0	19 38 41.84	2.4484	S. 17° 38' 34.3	8.216
1	17 38 47.66	2.6251	21 43 46.7	1.847	1	19 41 8.59	2.4442	17 30 18.1	8.328
2	17 41 25.12	2.6235	21 41 51.2	2.002	2	19 43 35.03	2.4380	17 21 55.5	8.430
3	17 44 2.48	2.6218	21 39 46.5	2.156	3	19 46 1.16	2.4328	17 13 26.5	8.536
4	17 46 39.73	2.6199	21 37 32.6	2.309	4	19 48 26.97	2.4276	17 4 51.2	8.640
5	17 49 16.87	2.6180	21 35 9.4	2.463	5	19 50 52.47	2.4224	16 56 9.7	8.742
6	17 51 53.89	2.6159	21 32 37.0	2.616	6	19 53 17.66	2.4172	16 47 22.2	8.843
7	17 54 30.78	2.6137	21 29 55.5	2.768	7	19 55 42.53	2.4118	16 38 28.6	8.942
8	17 57 7.53	2.6113	21 27 4.9	2.919	8	19 58 7.08	2.4066	16 29 29.1	9.040
9	17 59 44.14	2.6089	21 24 5.2	3.070	9	20 0 31.32	2.4013	16 20 23.8	9.137
10	18 2 20.60	2.6064	21 20 56.5	3.221	10	20 2 55.24	2.3960	16 11 12.7	9.233
11	18 4 56.91	2.6038	21 17 38.7	3.371	11	20 5 18.84	2.3907	16 1 55.9	9.327
12	18 7 33.06	2.6011	21 14 12.0	3.519	12	20 7 42.13	2.3856	15 52 33.5	9.419
13	18 10 9.04	2.5982	21 10 36.4	3.668	13	20 10 5.11	2.3803	15 43 5.6	9.511
14	18 12 44.84	2.5952	21 6 51.9	3.816	14	20 12 27.77	2.3750	15 33 32.2	9.601
15	18 15 20.46	2.5922	21 2 58.5	3.963	15	20 14 50.11	2.3698	15 23 53.5	9.689
16	18 17 55.90	2.5890	20 58 56.4	4.107	16	20 17 12.14	2.3645	15 14 9.6	9.775
17	18 20 31.14	2.5857	20 54 45.6	4.252	17	20 19 33.85	2.3592	15 4 20.5	9.860
18	18 23 6.19	2.5824	20 50 26.1	4.397	18	20 21 55.25	2.3541	14 54 26.3	9.945
19	18 25 41.03	2.5789	20 45 57.9	4.541	19	20 24 16.34	2.3488	14 44 27.1	10.028
20	18 28 15.66	2.5754	20 41 21.2	4.683	20	20 26 37.11	2.3436	14 34 22.9	10.110
21	18 30 50.08	2.5717	20 36 36.0	4.824	21	20 28 57.57	2.3384	14 24 13.9	10.190
22	18 33 24.27	2.5680	20 31 42.3	4.965	22	20 31 17.72	2.3332	14 14 0.2	10.268
23	18 35 58.24	2.5642	20 26 40.2	5.104	23	20 33 37.56	2.3282	14 3 41.8	10.345
24	18 38 31.98	2.5603	S. 20° 21' 29.8	5.243	24	20 35 57.10	2.3231	S. 13° 53' 18.8	10.421

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 9.					MONDAY 11.				
0	^h 20 ^m 35 ^s 57.10	2.3231	S. 13° 53' 18.8	10.421	0	^h 22 ^m 22 ^s 17.50	2.1266	S. 4° 31' 22.1	12.603
1	20 38 16.33	2.3180	13 42 51.3	10.495	1	22 24 25.01	2.1290	4 18 51.5	12.517
2	20 40 35.26	2.3129	13 32 19.4	10.566	2	22 26 32.36	2.1311	4 6 20.1	12.529
3	20 42 53.88	2.3078	13 21 43.1	10.640	3	22 28 39.54	2.1184	3 53 48.0	12.540
4	20 45 12.20	2.3028	13 11 2.6	10.710	4	22 30 46.57	2.1168	3 41 15.3	12.549
5	20 47 30.22	2.2979	13 0 17.9	10.778	5	22 32 53.44	2.1183	3 28 42.1	12.556
6	20 49 47.94	2.2929	12 49 29.2	10.846	6	22 35 0.17	2.1109	3 16 8.3	12.566
7	20 52 5.37	2.2880	12 38 36.4	10.912	7	22 37 6.75	2.1084	3 3 34.1	12.573
8	20 54 22.51	2.2832	12 27 39.7	10.977	8	22 39 13.18	2.1060	2 50 59.5	12.579
9	20 56 39.36	2.2783	12 16 39.2	11.040	9	22 41 19.47	2.1037	2 38 24.6	12.583
10	20 58 55.91	2.2735	12 5 34.9	11.102	10	22 43 25.63	2.1016	2 25 49.5	12.587
11	21 1 12.18	2.2688	11 54 26.9	11.163	11	22 45 31.66	2.0994	2 13 14.2	12.589
12	21 3 28.16	2.2639	11 43 15.3	11.222	12	22 47 37.56	2.0973	2 0 38.8	12.591
13	21 5 43.86	2.2593	11 32 0.2	11.280	13	22 49 43.33	2.0952	1 48 3.3	12.591
14	21 7 59.28	2.2547	11 20 41.7	11.337	14	22 51 48.98	2.0933	1 35 27.9	12.589
15	21 10 14.42	2.2500	11 9 19.8	11.393	15	22 53 54.52	2.0913	1 22 52.6	12.587
16	21 12 29.28	2.2454	10 57 54.7	11.445	16	22 55 59.94	2.0894	1 10 17.4	12.585
17	21 14 43.87	2.2409	10 46 26.4	11.498	17	22 58 5.25	2.0876	0 57 42.4	12.581
18	21 16 58.19	2.2365	10 34 54.9	11.550	18	23 0 10.45	2.0859	0 45 7.7	12.576
19	21 19 12.25	2.2322	10 23 20.4	11.600	19	23 2 15.56	2.0842	0 32 33.3	12.570
20	21 21 26.05	2.2277	10 11 42.9	11.648	20	23 4 20.56	2.0826	0 19 59.3	12.563
21	21 23 39.58	2.2233	10 0 2.6	11.695	21	23 6 25.46	2.0809	S. 0 7 25.8	12.556
22	21 25 52.85	2.2191	9 48 19.5	11.742	22	23 8 30.27	2.0794	N. 0 5 7.2	12.546
23	21 28 5.87	2.2148	S. 9 36 33.6	11.786	23	23 10 34.99	2.0780	N. 0 17 39.7	12.536
SUNDAY 10.					TUESDAY 12.				
0	21 30 18.63	2.2106	S. 9 24 45.1	11.829	0	23 12 39.63	2.0766	N. 0 30 11.6	12.526
1	21 32 31.14	2.2065	9 12 54.1	11.872	1	23 14 44.18	2.0753	0 42 42.7	12.513
2	21 34 43.41	2.2025	9 1 0.5	11.914	2	23 16 48.66	2.0740	0 55 13.1	12.500
3	21 36 55.44	2.1984	8 49 4.5	11.953	3	23 18 53.06	2.0727	1 7 42.7	12.486
4	21 39 7.22	2.1944	8 37 6.2	11.991	4	23 20 57.39	2.0716	1 20 11.4	12.470
5	21 41 18.77	2.1905	8 25 5.6	12.028	5	23 23 1.65	2.0704	1 32 39.1	12.454
6	21 43 30.08	2.1866	8 13 2.8	12.064	6	23 25 5.84	2.0694	1 45 5.9	12.437
7	21 45 41.16	2.1828	8 0 57.9	12.098	7	23 27 9.98	2.0684	1 57 31.6	12.419
8	21 47 52.01	2.1790	7 48 51.0	12.131	8	23 29 14.05	2.0676	2 9 56.2	12.400
9	21 50 2.64	2.1753	7 36 42.1	12.164	9	23 31 18.07	2.0668	2 22 19.6	12.380
10	21 52 13.05	2.1717	7 24 31.3	12.196	10	23 33 22.04	2.0667	2 34 41.8	12.360
11	21 54 23.24	2.1681	7 12 18.7	12.224	11	23 35 25.96	2.0660	2 47 2.7	12.337
12	21 56 33.22	2.1646	7 0 4.4	12.252	12	23 37 29.84	2.0643	2 59 22.3	12.316
13	21 58 42.99	2.1611	6 47 48.4	12.280	13	23 39 33.68	2.0636	3 11 40.5	12.291
14	22 0 52.55	2.1576	6 35 30.8	12.307	14	23 41 37.47	2.0629	3 23 57.2	12.266
15	22 3 1.90	2.1543	6 23 11.6	12.332	15	23 43 41.23	2.0624	3 36 12.4	12.240
16	22 5 11.05	2.1509	6 10 51.0	12.356	16	23 45 44.96	2.0619	3 48 26.0	12.213
17	22 7 20.01	2.1478	5 58 29.0	12.377	17	23 47 48.66	2.0616	4 0 38.0	12.186
18	22 9 28.78	2.1445	5 46 5.7	12.399	18	23 49 52.34	2.0612	4 12 48.3	12.157
19	22 11 37.35	2.1413	5 33 41.1	12.419	19	23 51 56.00	2.0608	4 24 56.8	12.127
20	22 13 45.74	2.1382	5 21 15.4	12.438	20	23 53 59.63	2.0603	4 37 3.6	12.097
21	22 15 53.94	2.1352	5 8 48.6	12.456	21	23 56 3.24	2.0601	4 49 8.5	12.066
22	22 18 1.97	2.1323	4 56 20.7	12.473	22	23 58 6.85	2.0600	5 1 11.5	12.034
23	22 20 9.82	2.1294	4 43 51.9	12.488	23	0 0 10.44	2.0598	5 13 12.6	12.001
24	22 22 17.50	2.1266	S. 4 31 22.1	12.503	24	0 2 14.03	2.0597	N. 5 25 11.6	11.968

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s 0 2 14.03	2.0597	N. 5 25 11.6	11.966	0	h m s 1 41 46.30	2.1001	N. 14 3 47.1	9.322
1	0 4 17.61	2.0597	5 37 8.5	11.931	1	1 43 52.35	2.1016	14 13 4.2	9.248
2	0 6 21.19	2.0597	5 49 3.3	11.896	2	1 45 58.49	2.1032	14 22 16.8	9.172
3	0 8 24.78	2.0597	6 0 56.0	11.860	3	1 48 4.73	2.1047	14 31 24.8	9.096
4	0 10 28.36	2.0598	6 12 46.5	11.822	4	1 50 11.05	2.1061	14 40 28.3	9.019
5	0 12 31.95	2.0599	6 24 34.7	11.783	5	1 52 17.46	2.1076	14 49 27.1	8.942
6	0 14 35.55	2.0600	6 36 20.5	11.743	6	1 54 23.96	2.1092	14 58 21.3	8.864
7	0 16 39.16	2.0603	6 48 3.9	11.703	7	1 56 30.56	2.1107	15 7 10.8	8.786
8	0 18 42.79	2.0607	6 59 44.9	11.662	8	1 58 37.25	2.1122	15 15 55.5	8.706
9	0 20 46.44	2.0610	7 11 23.4	11.620	9	2 0 44.03	2.1137	15 24 35.4	8.624
10	0 22 50.10	2.0613	7 22 59.3	11.577	10	2 2 50.90	2.1153	15 33 10.4	8.543
11	0 24 53.80	2.0617	7 34 32.6	11.532	11	2 4 57.87	2.1169	15 41 40.6	8.462
12	0 26 57.51	2.0621	7 46 3.2	11.487	12	2 7 4.93	2.1184	15 50 5.9	8.380
13	0 29 1.25	2.0626	7 57 31.1	11.442	13	2 9 12.08	2.1200	15 58 26.2	8.297
14	0 31 5.03	2.0632	8 8 56.3	11.396	14	2 11 19.33	2.1216	16 6 41.5	8.213
15	0 33 8.84	2.0638	8 20 18.6	11.349	15	2 13 26.67	2.1231	16 14 51.8	8.129
16	0 35 12.68	2.0643	8 31 38.1	11.301	16	2 15 34.10	2.1247	16 22 57.0	8.044
17	0 37 16.56	2.0649	8 42 54.7	11.251	17	2 17 41.63	2.1262	16 30 57.1	7.959
18	0 39 20.48	2.0657	8 54 8.2	11.200	18	2 19 49.25	2.1277	16 38 52.0	7.873
19	0 41 24.44	2.0664	9 5 18.7	11.150	19	2 21 56.96	2.1292	16 46 41.8	7.786
20	0 43 28.45	2.0672	9 16 26.2	11.099	20	2 24 4.76	2.1307	16 54 26.3	7.698
21	0 45 32.50	2.0679	9 27 30.6	11.047	21	2 26 12.65	2.1322	17 2 5.6	7.610
22	0 47 36.60	2.0687	9 38 31.8	10.993	22	2 28 20.63	2.1338	17 9 39.5	7.521
23	0 49 40.75	2.0696	N. 9 49 29.7	10.938	23	2 30 28.71	2.1353	N. 17 17 8.1	7.432
THURSDAY 14.					SATURDAY 16.				
0	0 51 44.96	2.0706	N. 10 0 24.4	10.884	0	2 32 36.87	2.1367	N. 17 24 31.3	7.343
1	0 53 49.22	2.0715	10 11 15.8	10.828	1	2 34 45.12	2.1382	17 31 49.1	7.262
2	0 55 53.54	2.0726	10 22 3.8	10.771	2	2 36 53.46	2.1397	17 39 1.5	7.161
3	0 57 57.92	2.0738	10 32 48.3	10.713	3	2 39 1.89	2.1412	17 46 8.4	7.069
4	1 0 2.36	2.0745	10 43 29.4	10.656	4	2 41 10.41	2.1427	17 53 9.8	6.977
5	1 2 6.86	2.0755	10 54 7.0	10.597	5	2 43 19.01	2.1440	18 0 5.6	6.884
6	1 4 11.42	2.0766	11 4 41.0	10.536	6	2 45 27.69	2.1454	18 6 55.8	6.791
7	1 6 16.05	2.0777	11 15 11.3	10.475	7	2 47 36.46	2.1468	18 13 40.5	6.697
8	1 8 20.75	2.0789	11 25 38.0	10.414	8	2 49 45.31	2.1483	18 20 19.5	6.603
9	1 10 25.52	2.0801	11 36 1.0	10.352	9	2 51 54.25	2.1497	18 26 52.9	6.508
10	1 12 30.36	2.0813	11 46 20.2	10.288	10	2 54 3.27	2.1509	18 33 20.5	6.412
11	1 14 35.27	2.0826	11 56 35.6	10.224	11	2 56 12.36	2.1522	18 39 42.4	6.317
12	1 16 40.26	2.0837	12 6 47.1	10.159	12	2 58 21.53	2.1535	18 45 58.6	6.222
13	1 18 45.32	2.0849	12 16 54.7	10.093	13	3 0 30.78	2.1548	18 52 9.0	6.124
14	1 20 50.46	2.0862	12 26 58.3	10.027	14	3 2 40.11	2.1560	18 58 13.5	6.027
15	1 22 55.67	2.0876	12 36 58.0	9.961	15	3 4 49.51	2.1573	19 4 12.2	5.929
16	1 25 0.97	2.0890	12 46 53.6	9.893	16	3 6 58.98	2.1584	19 10 5.0	5.831
17	1 27 6.35	2.0903	12 56 45.1	9.823	17	3 9 8.52	2.1596	19 15 51.9	5.732
18	1 29 11.80	2.0916	13 6 32.4	9.754	18	3 11 18.13	2.1607	19 21 32.9	5.634
19	1 31 17.34	2.0930	13 16 15.6	9.685	19	3 13 27.81	2.1619	19 27 8.0	5.536
20	1 33 22.96	2.0944	13 25 54.6	9.613	20	3 15 37.56	2.1630	19 32 37.1	5.436
21	1 35 28.67	2.0958	13 35 29.2	9.541	21	3 17 47.37	2.1641	19 38 0.2	5.335
22	1 37 34.46	2.0973	13 44 59.5	9.469	22	3 19 57.25	2.1651	19 43 17.3	5.234
23	1 39 40.34	2.0987	13 54 25.5	9.396	23	3 22 7.18	2.1660	19 48 28.3	5.133
24	1 41 46.30	2.1001	N. 14 3 47.1	9.323	24	3 24 17.17	2.1670	N. 19 53 33.2	5.031

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 17.					TUESDAY 19.				
0	h m s	s	N.19° 53' 33.2	"	0	h m s	s	N.21° 53' 48.0	"
1	3 24 17.17	2.1870	19 58 32.0	4.928	1	5 8 40.43	2.1687	21 53 41.3	0.165
2	3 26 27.22	2.1879	20 3 24.7	4.927	2	5 10 50.34	2.1646	21 53 28.2	0.271
3	3 28 37.32	2.1888	20 8 11.3	4.725	3	5 13 0.18	2.1634	21 53 8.8	0.377
4	3 30 47.48	2.1897	20 12 51.8	4.623	4	5 15 9.95	2.1622	21 52 43.0	0.482
5	3 32 57.69	2.1706	20 17 26.1	4.519	5	5 17 19.64	2.1608	21 52 10.9	0.587
6	3 35 7.95	2.1714	20 21 54.1	4.416	6	5 19 29.25	2.1596	21 51 32.5	0.693
7	3 37 18.26	2.1722	20 26 16.0	4.312	7	5 21 38.79	2.1582	21 50 47.7	0.798
8	3 39 28.61	2.1729	20 30 31.6	4.208	8	5 23 48.24	2.1568	21 49 56.7	0.902
9	3 41 39.00	2.1735	20 34 41.0	4.104	9	5 25 57.61	2.1554	21 48 59.4	1.007
10	3 43 49.43	2.1742	20 38 44.1	3.999	10	5 28 6.89	2.1539	21 47 55.8	1.112
11	3 45 59.90	2.1748	20 42 40.9	3.895	11	5 30 16.08	2.1524	21 46 46.0	1.216
12	3 48 10.41	2.1754	20 46 31.5	3.790	12	5 32 25.18	2.1509	21 45 29.9	1.320
13	3 50 20.95	2.1760	20 50 15.7	3.684	13	5 34 34.19	2.1493	21 44 7.6	1.423
14	3 52 31.52	2.1763	20 53 53.6	3.579	14	5 36 43.10	2.1477	21 42 39.1	1.526
15	3 54 42.11	2.1768	20 57 25.2	3.473	15	5 38 51.91	2.1460	21 41 4.5	1.628
16	3 56 52.73	2.1773	21 0 50.4	3.367	16	5 41 0.62	2.1443	21 39 23.7	1.731
17	3 59 3.38	2.1777	21 4 9.3	3.262	17	5 43 9.23	2.1426	21 37 36.8	1.833
18	4 1 14.05	2.1779	21 7 21.8	3.156	18	5 45 17.73	2.1408	21 35 43.7	1.936
19	4 3 24.73	2.1782	21 10 27.9	3.048	19	5 47 26.13	2.1390	21 33 44.5	2.037
20	4 5 35.43	2.1784	21 13 27.6	2.942	20	5 49 34.41	2.1370	21 31 39.2	2.138
21	4 7 46.14	2.1786	21 16 20.9	2.836	21	5 51 42.58	2.1352	21 29 27.9	2.239
22	4 9 56.86	2.1787	21 19 7.9	2.730	22	5 53 50.64	2.1333	21 27 10.5	2.340
23	4 12 7.59	2.1789	N.21 21 48.4	2.622	23	5 55 58.58	2.1314	N.21 24 47.1	2.440
24	4 14 18.33	2.1790				5 58 6.41	2.1296		
MONDAY 18.					WEDNESDAY 20.				
0	4 16 29.07	2.1790	N.21 24 22.5	2.515	0	6 0 14.12	2.1274	N.21 22 17.7	2.540
1	4 18 39.81	2.1790	21 26 50.2	2.407	1	6 2 21.70	2.1252	21 19 42.3	2.639
2	4 20 50.55	2.1789	21 29 11.4	2.300	2	6 4 29.16	2.1233	21 17 1.0	2.738
3	4 23 1.28	2.1788	21 31 26.2	2.193	3	6 6 36.50	2.1213	21 14 13.7	2.837
4	4 25 12.00	2.1786	21 33 34.5	2.085	4	6 8 43.71	2.1191	21 11 20.6	2.935
5	4 27 22.71	2.1784	21 35 36.4	1.977	5	6 10 50.79	2.1169	21 8 21.6	3.032
6	4 29 33.41	2.1781	21 37 31.8	1.870	6	6 12 57.74	2.1147	21 5 16.7	3.130
7	4 31 44.09	2.1778	21 39 20.8	1.763	7	6 15 4.56	2.1126	21 2 5.9	3.228
8	4 33 54.75	2.1775	21 41 3.4	1.656	8	6 17 11.25	2.1103	20 58 49.3	3.324
9	4 36 5.39	2.1771	21 42 39.5	1.548	9	6 19 17.80	2.1080	20 55 27.0	3.420
10	4 38 16.00	2.1767	21 44 9.2	1.441	10	6 21 24.21	2.1067	20 51 58.9	3.516
11	4 40 26.59	2.1762	21 45 32.4	1.333	11	6 23 30.49	2.1053	20 48 25.1	3.612
12	4 42 37.15	2.1757	21 46 49.1	1.226	12	6 25 36.63	2.1032	20 44 45.5	3.707
13	4 44 47.67	2.1750	21 47 59.4	1.117	13	6 27 42.63	2.0998	20 41 0.2	3.802
14	4 46 58.15	2.1744	21 49 3.2	1.010	14	6 29 48.48	2.0963	20 37 9.3	3.896
15	4 49 8.60	2.1736	21 50 0.6	0.903	15	6 31 54.19	2.0940	20 33 12.8	3.988
16	4 51 19.01	2.1731	21 50 51.6	0.796	16	6 33 59.76	2.0917	20 29 10.7	4.083
17	4 53 29.37	2.1723	21 51 36.1	0.688	17	6 36 5.19	2.0892	20 25 3.0	4.174
18	4 55 39.69	2.1716	21 52 14.2	0.582	18	6 38 10.47	2.0867	20 20 49.8	4.266
19	4 57 49.96	2.1707	21 52 45.9	0.474	19	6 40 15.60	2.0843	20 16 31.1	4.357
20	5 0 0.17	2.1698	21 53 11.1	0.367	20	6 42 20.58	2.0817	20 12 6.9	4.449
21	5 2 10.33	2.1688	21 53 29.9	0.260	21	6 44 25.41	2.0793	20 7 37.2	4.540
22	5 4 20.42	2.1677	21 53 42.3	0.153	22	6 46 30.10	2.0768	20 3 2.1	4.630
23	5 6 30.45	2.1667	21 53 48.3	0.047	23	6 48 34.63	2.0743	19 58 21.6	4.720
24	5 8 40.43	2.1657	N.21 53 48.0	0.040	24	6 50 39.01	2.0717	N.19 53 35.7	4.809

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 21.					SATURDAY 23.				
0	h m s 6 50 39.01	2.0717	N.19° 53' 35.7"	4.909	0	h m s 8 27 12.11	1.9656	N.14° 30' 4.6"	8.461
1	6 52 43.24	2.0692	19 48 44.5	4.897	1	8 29 9.38	1.9636	14 21 35.1	8.523
2	6 54 47.32	2.0667	19 43 48.0	4.866	2	8 31 6.54	1.9617	14 13 1.8	8.586
3	6 56 51.25	2.0642	19 38 46.2	5.073	3	8 33 3.58	1.9498	14 4 24.8	8.647
4	6 58 55.02	2.0616	19 33 39.2	5.160	4	8 35 0.51	1.9479	13 55 44.2	8.707
5	7 0 58.64	2.0590	19 28 27.0	5.245	5	8 36 57.33	1.9400	13 46 59.9	8.768
6	7 3 2.10	2.0564	19 23 9.6	5.333	6	8 38 54.03	1.9442	13 38 12.0	8.826
7	7 5 5.41	2.0539	19 17 47.0	5.419	7	8 40 50.63	1.9424	13 29 20.5	8.887
8	7 7 8.57	2.0513	19 12 19.3	5.504	8	8 42 47.12	1.9407	13 20 25.5	8.946
9	7 9 11.57	2.0487	19 6 46.5	5.589	9	8 44 43.51	1.9389	13 11 27.0	9.004
10	7 11 14.42	2.0462	19 1 8.6	5.673	10	8 46 39.79	1.9373	13 2 25.0	9.062
11	7 13 17.11	2.0436	18 55 25.8	5.756	11	8 48 35.98	1.9367	12 53 19.6	9.119
12	7 15 19.65	2.0410	18 49 37.9	5.840	12	8 50 32.07	1.9340	12 44 10.7	9.176
13	7 17 22.03	2.0384	18 43 45.0	5.923	13	8 52 28.06	1.9324	12 34 58.5	9.231
14	7 19 24.26	2.0358	18 37 47.2	6.004	14	8 54 23.96	1.9309	12 25 42.9	9.287
15	7 21 26.33	2.0332	18 31 44.6	6.084	15	8 56 19.77	1.9296	12 16 24.1	9.341
16	7 23 28.25	2.0307	18 25 37.1	6.166	16	8 58 15.50	1.9281	12 7 2.0	9.395
17	7 25 30.02	2.0282	18 19 24.7	6.246	17	9 0 11.14	1.9267	11 57 36.7	9.449
18	7 27 31.63	2.0256	18 13 7.6	6.325	18	9 2 6.70	1.9263	11 48 8.1	9.503
19	7 29 33.09	2.0231	18 6 45.7	6.405	19	9 4 2.17	1.9239	11 38 36.3	9.556
20	7 31 34.40	2.0206	18 0 19.0	6.484	20	9 5 57.57	1.9227	11 29 1.4	9.607
21	7 33 35.55	2.0179	17 53 47.6	6.562	21	9 7 52.89	1.9214	11 19 23.4	9.659
22	7 35 36.55	2.0154	17 47 11.6	6.639	22	9 9 48.14	1.9202	11 9 42.3	9.716
23	7 37 37.40	2.0129	N.17° 40' 30.9"	6.717	23	9 11 43.31	1.9190	N.10° 59' 58.2"	9.769
FRIDAY 22.					SUNDAY 24.				
0	7 39 38.10	2.0104	N.17° 33' 45.6"	6.793	0	9 13 38.42	1.9179	N.10° 50' 11.1"	9.810
1	7 41 38.65	2.0079	17 26 55.8	6.868	1	9 15 33.46	1.9169	10 40 21.0	9.860
2	7 43 39.05	2.0054	17 20 1.4	6.944	2	9 17 28.44	1.9168	10 30 27.9	9.909
3	7 45 39.30	2.0029	17 13 2.5	7.019	3	9 19 23.36	1.9149	10 20 31.9	9.967
4	7 47 39.40	2.0005	17 5 59.1	7.093	4	9 21 18.23	1.9140	10 10 33.1	10.004
5	7 49 39.36	1.9981	16 58 51.3	7.167	5	9 23 13.04	1.9131	10 0 31.4	10.062
6	7 51 39.17	1.9956	16 51 39.1	7.240	6	9 25 7.80	1.9128	9 50 26.9	10.098
7	7 53 38.83	1.9932	16 44 22.5	7.312	7	9 27 2.51	1.9116	9 40 19.7	10.143
8	7 55 38.35	1.9908	16 37 1.6	7.384	8	9 28 57.18	1.9107	9 30 9.7	10.189
9	7 57 37.73	1.9884	16 29 36.4	7.456	9	9 30 51.80	1.9100	9 19 57.0	10.234
10	7 59 36.96	1.9861	16 22 6.9	7.527	10	9 32 46.38	1.9094	9 9 41.6	10.279
11	8 1 36.06	1.9836	16 14 33.2	7.597	11	9 34 40.93	1.9088	8 59 23.5	10.323
12	8 3 35.02	1.9815	16 6 55.3	7.667	12	9 36 35.44	1.9082	8 49 2.8	10.367
13	8 5 33.84	1.9792	15 59 13.2	7.736	13	9 38 29.92	1.9077	8 38 39.5	10.409
14	8 7 32.52	1.9768	15 51 27.0	7.804	14	9 40 24.37	1.9073	8 28 13.7	10.451
15	8 9 31.06	1.9746	15 43 36.7	7.872	15	9 42 18.80	1.9069	8 17 45.4	10.493
16	8 11 29.47	1.9723	15 35 42.3	7.940	16	9 44 13.20	1.9066	8 7 14.6	10.533
17	8 13 27.75	1.9702	15 27 43.9	8.007	17	9 46 7.59	1.9063	7 56 41.4	10.574
18	8 15 25.89	1.9680	15 19 41.5	8.073	18	9 48 1.96	1.9060	7 46 5.7	10.614
19	8 17 23.91	1.9659	15 11 35.1	8.140	19	9 49 56.32	1.9059	7 35 27.7	10.653
20	8 19 21.80	1.9638	15 3 24.7	8.206	20	9 51 50.67	1.9068	7 24 47.3	10.692
21	8 21 19.56	1.9617	14 55 10.4	8.270	21	9 53 45.01	1.9057	7 14 4.6	10.730
22	8 23 17.20	1.9597	14 46 52.3	8.333	22	9 55 39.35	1.9057	7 3 19.7	10.768
23	8 25 14.72	1.9576	14 38 30.4	8.397	23	9 57 33.69	1.9057	6 52 32.5	10.805
24	8 27 12.11	1.9556	N.14° 30' 4.6"	8.461	24	9 59 28.03	1.9057	N. 6° 41' 43.1"	10.843

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 25.					WEDNESDAY 27.				
0	9 59 28.03	1.9068	N. 6 41 43.1	10.842	0	11 32 9.58	1.9802	S. 2 29 0.8	11.848
1	10 1 22.38	1.9069	6 30 51.5	10.877	1	11 34 8.49	1.9833	2 40 51.8	11.852
2	10 3 16.74	1.9061	6 19 57.8	10.912	2	11 36 7.58	1.9865	2 52 43.0	11.854
3	10 5 11.11	1.9063	6 9 2.0	10.947	3	11 38 6.87	1.9898	3 4 34.3	11.856
4	10 7 5.50	1.9067	5 58 4.2	10.981	4	11 40 6.36	1.9932	3 16 25.7	11.867
5	10 8 59.91	1.9071	5 47 4.3	11.016	5	11 42 6.05	1.9966	3 28 17.1	11.867
6	10 10 54.35	1.9075	5 36 2.4	11.048	6	11 44 5.95	2.0000	3 40 8.5	11.866
7	10 12 48.81	1.9079	5 24 58.5	11.081	7	11 46 6.05	2.0034	3 51 59.8	11.864
8	10 14 43.30	1.9085	5 13 52.7	11.112	8	11 48 6.36	2.0070	4 3 50.9	11.851
9	10 16 37.83	1.9091	5 2 45.0	11.143	9	11 50 6.89	2.0107	4 15 41.9	11.848
10	10 18 32.39	1.9097	4 51 35.5	11.174	10	11 52 7.64	2.0144	4 27 32.6	11.843
11	10 20 26.99	1.9104	4 40 24.1	11.204	11	11 54 8.62	2.0182	4 39 23.0	11.837
12	10 22 21.64	1.9112	4 29 11.0	11.233	12	11 56 9.82	2.0220	4 51 13.1	11.831
13	10 24 16.34	1.9121	4 17 56.1	11.262	13	11 58 11.26	2.0259	5 3 2.8	11.824
14	10 26 11.09	1.9129	4 6 39.5	11.290	14	12 0 12.93	2.0298	5 14 52.0	11.816
15	10 28 5.89	1.9138	3 55 21.3	11.318	15	12 2 14.84	2.0339	5 26 40.7	11.807
16	10 30 0.75	1.9146	3 44 1.4	11.345	16	12 4 17.00	2.0381	5 38 28.8	11.797
17	10 31 55.67	1.9156	3 32 39.9	11.371	17	12 6 19.41	2.0423	5 50 16.3	11.785
18	10 33 50.66	1.9171	3 21 16.9	11.397	18	12 8 22.07	2.0464	6 2 3.0	11.773
19	10 35 45.72	1.9183	3 9 52.3	11.423	19	12 10 24.98	2.0507	6 13 49.0	11.760
20	10 37 40.85	1.9195	2 58 26.3	11.446	20	12 12 28.16	2.0542	6 25 34.2	11.746
21	10 39 36.06	1.9208	2 46 58.8	11.470	21	12 14 31.60	2.0586	6 37 18.5	11.731
22	10 41 31.35	1.9222	2 35 29.9	11.493	22	12 16 35.30	2.0640	6 49 1.9	11.714
23	10 43 26.72	1.9236	N. 2 23 59.6	11.516	23	12 18 39.28	2.0696	S. 7 0 44.2	11.697
TUESDAY 26.					THURSDAY 28.				
0	10 45 22.18	1.9261	N. 2 12 28.0	11.538	0	12 20 43.53	2.0732	S. 7 12 25.5	11.678
1	10 47 17.73	1.9267	2 0 55.1	11.559	1	12 22 48.06	2.0778	7 24 5.6	11.659
2	10 49 13.38	1.9283	1 49 20.9	11.579	2	12 24 52.87	2.0826	7 35 44.6	11.639
3	10 51 9.13	1.9300	1 37 45.6	11.598	3	12 26 57.97	2.0874	7 47 22.3	11.618
4	10 53 4.98	1.9318	1 26 9.1	11.618	4	12 29 3.36	2.0923	7 58 58.7	11.595
5	10 55 0.94	1.9336	1 14 31.5	11.636	5	12 31 9.04	2.0972	8 10 33.7	11.572
6	10 56 57.01	1.9355	1 2 52.8	11.654	6	12 33 15.02	2.1023	8 22 7.3	11.547
7	10 58 53.20	1.9374	0 51 13.0	11.672	7	12 35 21.31	2.1073	8 33 39.3	11.520
8	11 0 49.50	1.9398	0 39 32.2	11.688	8	12 37 27.90	2.1124	8 45 9.7	11.493
9	11 2 45.92	1.9414	0 27 50.5	11.703	9	12 39 34.80	2.1176	8 56 38.4	11.464
10	11 4 42.47	1.9436	0 16 7.8	11.718	10	12 41 42.01	2.1228	9 8 5.4	11.435
11	11 6 39.15	1.9468	N. 0 4 24.3	11.732	11	12 43 49.53	2.1280	9 19 30.6	11.404
12	11 8 35.97	1.9481	S. 0 7 20.1	11.747	12	12 45 57.37	2.1334	9 30 53.9	11.372
13	11 10 32.92	1.9504	0 19 5.3	11.760	13	12 48 5.54	2.1388	9 42 15.3	11.339
14	11 12 30.01	1.9528	0 30 51.2	11.771	14	12 50 14.03	2.1442	9 53 34.5	11.304
15	11 14 27.25	1.9552	0 42 37.8	11.782	15	12 52 22.85	2.1497	10 4 51.8	11.269
16	11 16 24.64	1.9577	0 54 25.0	11.792	16	12 54 32.00	2.1553	10 16 6.9	11.233
17	11 18 22.18	1.9603	1 6 12.8	11.802	17	12 56 41.49	2.1609	10 27 19.7	11.194
18	11 20 19.88	1.9630	1 18 1.2	11.811	18	12 58 51.31	2.1666	10 38 30.2	11.156
19	11 22 17.74	1.9667	1 29 50.1	11.819	19	13 1 1.48	2.1723	10 49 38.3	11.114
20	11 24 15.76	1.9694	1 41 39.5	11.827	20	13 3 11.99	2.1781	11 0 43.9	11.073
21	11 26 13.95	1.9713	1 53 29.3	11.833	21	13 5 22.85	2.1839	11 11 47.0	11.029
22	11 28 12.32	1.9745	2 5 19.5	11.839	22	13 7 34.06	2.1898	11 22 47.4	10.984
23	11 30 10.86	1.9772	2 17 10.0	11.844	23	13 9 45.62	2.1967	11 33 45.1	10.938
24	11 32 9.58	1.9802	S. 2 29 0.8	11.848	24	13 11 57.54	2.2017	S. 11 44 40.0	10.892

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 29.					SUNDAY 31.				
0	^h 13 ^m 11 ^s 57.54	2.2017	S. 11° 44' 40.0"	10.892	0	^h 15 ^m 5 ^s 3.34	2.6126	S. 19° 5' 21.5"	6.888
1	13 14 9.82	2.2077	11 55 32.1	10.843	1	15 7 34.28	2.6187	19 12 11.0	6.763
2	13 16 22.46	2.2137	12 6 21.2	10.793	2	15 10 5.59	2.6248	19 18 53.1	6.640
3	13 18 35.47	2.2198	12 17 7.2	10.741	3	15 12 37.26	2.6308	19 25 27.8	6.517
4	13 20 48.84	2.2260	12 27 50.1	10.688	4	15 15 9.29	2.6367	19 31 55.1	6.392
5	13 23 2.58	2.2322	12 38 29.8	10.634	5	15 17 41.67	2.6427	19 38 14.8	6.264
6	13 25 16.70	2.2384	12 49 6.2	10.579	6	15 20 14.41	2.6486	19 44 26.8	6.136
7	13 27 31.19	2.2447	12 59 39.3	10.522	7	15 22 47.49	2.6543	19 50 31.1	6.007
8	13 29 46.06	2.2510	13 10 8.9	10.463	8	15 25 20.91	2.6598	19 56 27.6	5.876
9	13 32 1.31	2.2573	13 20 34.9	10.403	9	15 27 54.67	2.6654	20 2 16.2	5.743
10	13 34 16.94	2.2637	13 30 57.3	10.343	10	15 30 28.76	2.6709	20 7 56.8	5.609
11	13 36 32.95	2.2701	13 41 16.0	10.280	11	15 33 3.18	2.6764	20 13 29.3	5.473
12	13 38 49.35	2.2766	13 51 30.9	10.216	12	15 35 37.93	2.6818	20 18 53.6	5.336
13	13 41 6.14	2.2830	14 1 41.9	10.160	13	15 38 13.00	2.6871	20 24 9.7	5.199
14	13 43 23.31	2.2894	14 11 48.9	10.103	14	15 40 48.38	2.6922	20 29 17.5	5.060
15	13 45 40.87	2.2960	14 21 51.8	10.044	15	15 43 24.06	2.6972	20 34 16.9	4.920
16	13 47 58.83	2.3026	14 31 50.6	9.984	16	15 46 0.05	2.6922	20 39 7.9	4.778
17	13 50 17.18	2.3092	14 41 45.1	9.922	17	15 48 36.33	2.6971	20 43 50.3	4.635
18	13 52 35.93	2.3158	14 51 35.3	9.859	18	15 51 12.90	2.6119	20 48 24.1	4.492
19	13 54 55.07	2.3224	15 1 21.0	9.794	19	15 53 49.76	2.6166	20 52 49.3	4.347
20	13 57 14.61	2.3290	15 11 2.2	9.728	20	15 56 26.89	2.6211	20 57 5.7	4.200
21	13 59 34.55	2.3356	15 20 38.8	9.670	21	15 59 4.29	2.6255	21 1 13.3	4.052
22	14 1 54.88	2.3422	15 30 10.6	9.611	22	16 1 41.95	2.6298	21 5 12.0	3.904
23	14 4 15.62	2.3489	S. 15 39 37.7	9.550	23	16 4 19.87	2.6342	S. 21 9 1.8	3.755
SATURDAY 30.					MONDAY, JUNE 1.				
0	14 6 36.75	2.3556	S. 15 48 59.9	9.328	0	16 6 58.05	2.6388	S. 21 12 42.6	3.604
1	14 8 58.29	2.3623	15 58 17.1	9.244	PHASES OF THE MOON.				
2	14 11 20.22	2.3690	16 7 29.2	9.159					
3	14 13 42.56	2.3757	16 16 36.2	9.072					
4	14 16 5.30	2.3824	16 25 37.9	8.983					
5	14 18 28.44	2.3891	16 34 34.2	8.893	\bigcirc Full Moon, . . . ^d 3 ^h 2 ^m 51.8 \bigcirc Last Quarter, . . . 9 19 15.9 \bullet New Moon, . . . 17 4 48.4 \bigcirc First Quarter, . . . 25 8 46.9				
6	14 20 51.99	2.3957	16 43 25.1	8.802					
7	14 23 15.93	2.4024	16 52 10.5	8.709					
8	14 25 40.28	2.4091	17 0 50.2	8.614					
9	14 28 5.02	2.4157	17 9 24.2	8.517	\subset Perigee, ^d 5 ^h 17.8 \subset Apogee, 21 14.0				
10	14 30 30.16	2.4224	17 17 52.3	8.419					
11	14 32 55.71	2.4291	17 26 14.5	8.320					
12	14 35 21.65	2.4357	17 34 30.7	8.219					
13	14 37 47.99	2.4422	17 42 40.8	8.116					
14	14 40 14.72	2.4487	17 50 44.6	8.012					
15	14 42 41.84	2.4553	17 58 42.2	7.907					
16	14 45 9.36	2.4619	18 6 33.4	7.799					
17	14 47 37.27	2.4684	18 14 18.1	7.690					
18	14 50 5.57	2.4748	18 21 56.2	7.579					
19	14 52 34.25	2.4812	18 29 27.6	7.468					
20	14 55 3.31	2.4874	18 36 52.3	7.354					
21	14 57 32.75	2.4938	18 44 10.1	7.239					
22	15 0 2.57	2.5002	18 51 21.0	7.122					
23	15 2 32.77	2.5064	18 58 24.8	7.004					
24	15 5 3.34	2.5126	S. 19 5 21.5	6.885					

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
1	Pollux W.	82° 15' 24"	2480	83° 55' 56"	2513	85° 36' 51"	2497	87° 18' 8"	2482
	Regulus W.	45 16 56	2498	46 58 12	2480	48 39 53	2462	50 21 59	2445
	Antares E.	54 40 41	2479	52 58 58	2464	51 16 54	2450	49 34 31	2436
	α Aquilæ E.	106 44 47	2925	105 13 3	2906	103 40 50	2882	102 8 8	2861
2	Regulus W.	58 58 18	2367	60 42 40	2353	62 27 23	2338	64 12 27	2326
	Saturn W.	27 58 37	2455	29 40 12	2455	31 22 28	2459	33 5 22	2408
	Antares E.	40 57 47	2373	39 13 33	2362	37 29 3	2352	35 44 19	2343
	α Aquilæ E.	94 18 18	2771	92 43 12	2756	91 7 47	2743	89 32 4	2730
3	Regulus W.	73 2 25	2365	74 49 16	2354	76 36 23	2345	78 23 44	2336
	Saturn W.	41 47 48	2398	43 33 36	2393	45 19 46	2379	47 6 16	2368
	Jupiter W.	21 19 19	2345	23 4 12	2317	24 49 46	2303	26 35 56	2271
	Spica W.	18 59 8	2358	20 46 9	2345	22 33 29	2334	24 21 6	2324
	α Aquilæ E.	81 29 49	2685	79 52 49	2680	78 15 42	2677	76 38 31	2674
	Fomalhaut E.	108 37 50	2774	107 2 48	2758	105 27 19	2735	103 51 26	2718
4	Regulus W.	87 23 45	2196	89 12 18	2190	91 1 0	2185	92 49 50	2180
	Saturn W.	56 3 11	2214	57 51 18	2205	59 39 37	2199	61 28 6	2193
	Jupiter W.	35 33 31	2198	37 22 2	2187	39 10 49	2178	40 59 49	2170
	Spica W.	33 22 45	2181	35 11 41	2174	37 0 47	2160	38 50 1	2154
	α Aquilæ E.	68 32 28	2687	66 55 30	2685	65 18 43	2705	63 42 10	2717
	Fomalhaut E.	95 47 0	2655	94 9 21	2647	92 31 30	2641	90 53 31	2635
5	Saturn W.	70 32 37	2170	72 21 49	2168	74 11 5	2167	76 0 23	2155
	Jupiter W.	50 7 28	2143	51 57 22	2140	53 47 20	2137	55 37 22	2136
	Spica W.	47 57 54	2145	49 47 43	2144	51 37 35	2143	53 27 28	2142
	α Aquilæ E.	55 44 38	2620	54 10 36	2651	52 37 14	2685	51 4 36	2694
	Fomalhaut E.	82 42 23	2630	81 4 9	2633	79 25 59	2638	77 47 56	2645
	α Pegasi E.	100 57 20	2285	99 10 58	2281	97 24 31	2279	95 38 1	2277
6	Saturn W.	85 7 2	2169	86 56 17	2170	88 45 29	2173	90 34 37	2177
	Jupiter W.	64 47 53	2136	66 37 57	2138	68 27 58	2140	70 17 56	2143
	Spica W.	62 36 55	2145	64 26 44	2148	66 16 30	2151	68 6 11	2155
	Antares W.	17 41 11	2267	19 27 30	2266	21 14 19	2261	23 1 30	2245
	Fomalhaut E.	69 40 35	2702	68 3 58	2719	66 27 43	2738	64 51 53	2760
	α Pegasi E.	86 45 19	2282	84 58 53	2285	83 12 32	2289	81 26 16	2294
7	Jupiter W.	79 26 27	2164	81 15 49	2169	83 5 3	2175	84 54 8	2182
	Spica W.	77 13 10	2177	79 2 12	2182	80 51 6	2188	82 39 51	2194
	Antares W.	32 0 10	2223	33 48 4	2224	35 35 56	2227	37 23 44	2230
	Fomalhaut E.	57 0 48	2904	55 28 34	2942	53 57 9	2985	52 26 37	3030
	α Pegasi E.	72 36 59	2327	70 51 39	2336	69 6 32	2345	67 21 39	2357
	SUN E.	127 18 39	2477	125 36 53	2482	123 55 15	2489	122 13 46	2496
8	Jupiter W.	93 57 2	2217	95 45 4	2225	97 32 54	2234	99 20 31	2242
	Spica W.	91 41 8	2221	93 28 50	2238	95 16 21	2246	97 3 40	2255
	Antares W.	46 21 15	2255	48 8 21	2261	49 55 18	2268	51 42 5	2275
	Fomalhaut E.	45 10 9	3345	43 46 49	3428	42 25 4	3522	41 5 4	3627
	α Pegasi E.	58 41 27	2422	56 58 24	2438	55 15 43	2455	53 33 26	2473
	SUN E.	113 48 45	2525	112 8 17	2540	110 28 0	2549	108 47 55	2559
9	Spica W.	105 57 4	2220	107 43 5	2206	109 28 53	2217	111 14 27	2226
	Antares W.	60 33 13	2315	62 18 51	2334	64 4 16	2333	65 49 28	2341
	α Pegasi E.	45 9 4	2587	43 29 51	2615	41 51 17	2646	40 13 25	2681

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Pollux W.	88° 59' 47"	2467	90° 41' 47"	2452	92° 24' 8"	2438	94° 6' 49"	2424
	Regulus W.	52 4 29	2429	53 47 22	2413	55 30 38	2397	57 14 17	2382
	Antares E.	47 51 48	2423	46 8 45	2410	44 25 24	2396	42 41 44	2384
	α Aquilæ E.	100 34 59	2841	99 1 24	2822	97 27 25	2806	95 53 3	2787
2	Regulus W.	65 57 50	2312	67 43 32	2300	69 29 32	2287	71 15 50	2276
	Saturn W.	34 48 52	2361	36 32 54	2361	38 17 25	2342	40 2 24	2324
	Antares E.	33 59 22	2335	32 14 13	2328	30 28 54	2322	28 43 27	2318
	α Aquilæ E.	87 56 4	2719	86 19 49	2709	84 43 21	2699	83 6 40	2692
3	Regulus W.	80 11 20	2226	81 59 9	2216	83 47 10	2210	85 35 22	2203
	Saturn W.	48 53 6	2243	50 40 14	2243	52 27 38	2233	54 15 17	2223
	Jupiter W.	28 22 38	2252	30 9 48	2236	31 57 22	2222	33 45 17	2209
	Spica W.	26 8 58	2214	27 57 5	2204	29 45 26	2196	31 34 0	2188
	α Aquilæ E.	75 1 16	2673	73 24 0	2674	71 46 45	2677	70 9 34	2681
	Fomalhaut E.	102 15 10	2703	100 38 34	2689	99 1 39	2676	97 24 27	2665
4	Regulus W.	94 38 47	2176	96 27 50	2172	98 16 59	2169	100 6 13	2167
	Saturn W.	63 16 45	2186	65 5 33	2182	66 54 28	2177	68 43 30	2174
	Jupiter W.	42 49 2	2163	44 38 25	2167	46 27 58	2151	48 17 40	2147
	Spica W.	40 39 23	2169	42 28 52	2165	44 18 28	2151	46 8 9	2149
	α Aquilæ E.	62 5 53	2732	60 29 56	2740	58 54 22	2710	57 19 15	2703
	Fomalhaut E.	89 15 24	2631	87 37 12	2629	85 58 56	2628	84 20 39	2629
5	Saturn W.	77 49 43	2165	79 39 4	2165	81 28 24	2166	83 17 44	2167
	Jupiter W.	57 27 27	2135	59 17 33	2134	61 7 40	2134	62 57 47	2135
	Spica W.	55 17 23	2143	57 7 17	2143	58 57 11	2143	60 47 4	2144
	α Aquilæ E.	49 32 48	2669	48 1 56	2618	46 32 5	2674	45 3 24	2138
	Fomalhaut E.	76 10 2	2662	74 32 18	2663	72 54 48	2674	71 17 33	2667
	α Pegasi E.	93 51 28	2277	92 4 54	2277	90 18 21	2278	88 31 49	2279
6	Saturn W.	92 23 39	2180	94 12 36	2184	96 1 27	2190	97 50 10	2196
	Jupiter W.	72 7 50	2146	73 57 39	2150	75 47 22	2166	77 36 58	2169
	Spica W.	69 55 47	2158	71 45 18	2163	73 34 42	2167	75 24 0	2173
	Antares W.	24 48 58	2232	26 36 38	2237	28 24 25	2234	30 12 17	2223
	Fomalhaut E.	63 16 32	2783	61 41 42	2808	60 7 25	2838	58 33 46	2869
	α Pegasi E.	79 40 7	2299	77 54 6	2305	76 8 14	2311	74 22 31	2319
7	Jupiter W.	86 43 3	2188	88 31 49	2196	90 20 24	2202	92 8 48	2209
	Spica W.	84 28 27	2201	86 16 53	2206	88 5 9	2216	89 53 14	2223
	Antares W.	39 11 27	2233	40 59 5	2238	42 46 36	2243	44 34 0	2249
	Fomalhaut E.	50 57 2	2682	49 28 30	2138	48 1 6	2300	46 34 57	2269
	α Pegasi E.	65 37 2	2366	63 52 41	2380	62 8 37	2393	60 24 52	2407
	Sun E.	120 32 26	2602	118 51 15	2609	117 10 14	2617	115 29 24	2626
8	Jupiter W.	101 7 56	2261	102 55 8	2260	104 42 6	2269	106 28 51	2279
	Spica W.	98 50 46	2263	100 37 40	2272	102 24 21	2281	104 10 49	2289
	Antares W.	53 28 41	2283	55 15 6	2290	57 1 20	2296	58 47 23	2307
	Fomalhaut E.	39 46 59	2744	38 30 58	2876	37 17 14	2926	36 5 59	2193
	α Pegasi E.	51 51 35	2492	50 10 11	2613	48 29 16	2636	46 48 53	2661
	Sun E.	107 8 3	2667	105 28 23	2677	103 48 56	2686	102 9 41	2696
9	Spica W.	112 59 48	2336	114 44 55	2346	116 29 48	2356	118 14 28	2366
	Antares W.	67 34 28	2350	69 19 15	2359	71 3 48	2368	72 48 8	2378
	α Pegasi E.	38 36 20	2719	37 0 6	2732	35 24 48	2808	33 50 31	2860

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Dif.	IIIh.	P. L. of Dif.	VIh.	P. L. of Dif.	IXh.	P. L. of Dif.
9	SUN	E.	100° 30' 39"	2604	98° 51' 50"	2616	97° 13' 15"	2624	95° 34' 53"	2635
10	Antares	W.	74 32 14	2387	76 16 7	2397	77 59 46	2406	79 43 12	2416
	α Aquilæ	W.	31 56 8	4490	33 0 9	4306	34 6 56	4146	35 16 13	4010
	SUN	E.	87 26 29	2685	85 49 29	2696	84 12 44	2707	82 36 13	2716
11	Antares	W.	88 16 56	2464	89 59 0	2474	91 40 50	2484	93 22 26	2493
	α Aquilæ	W.	41 31 29	3562	42 50 56	3493	44 11 28	3441	45 32 58	3396
	SUN	E.	74 37 2	2769	73 1 53	2779	71 26 58	2789	69 52 16	2800
12	Antares	W.	101 47 6	2541	103 27 22	2551	105 7 24	2561	106 47 13	2570
	α Aquilæ	W.	52 31 36	3239	53 56 59	3219	55 22 46	3200	56 48 55	3185
	SUN	E.	62 2 8	2851	60 28 46	2861	58 55 37	2871	57 22 41	2881
13	α Aquilæ	W.	64 3 23	3138	65 30 46	3133	66 58 16	3129	68 25 50	3127
	Fomalhaut	W.	39 42 52	3092	40 54 49	3004	42 8 5	3032	43 22 34	3768
	SUN	E.	49 41 12	2931	48 9 32	2940	46 38 4	2950	45 6 48	2960
14	α Aquilæ	W.	75 44 2	3129	77 11 37	3132	78 39 8	3135	80 6 35	3140
	Fomalhaut	W.	49 49 19	3546	51 8 52	3615	52 28 59	3488	53 49 36	3465
	SUN	E.	37 33 33	3008	36 3 30	3018	34 33 39	3027	33 4 0	3035
19	SUN	W.	20 9 28	3356	21 32 32	3364	22 55 30	3371	24 18 20	3376
	Regulus	E.	69 50 27	3018	68 20 36	3025	66 50 54	3031	65 21 20	3038
	Saturn	E.	100 48 2	3023	99 18 18	3029	97 48 41	3034	96 19 11	3041
20	SUN	W.	31 10 54	3408	32 33 7	3408	33 55 14	3414	35 17 15	3417
	Regulus	E.	57 55 27	3069	56 26 39	3074	54 57 58	3079	53 29 23	3085
	Saturn	E.	88 53 27	3067	87 24 37	3073	85 55 54	3077	84 27 16	3081
	Jupiter	E.	108 22 1	3034	106 52 30	3037	105 23 3	3041	103 53 41	3046
21	SUN	W.	42 6 16	3435	43 27 53	3437	44 49 28	3439	46 11 0	3441
	Regulus	E.	46 8 6	3110	44 40 9	3114	43 12 17	3119	41 44 31	3124
	Saturn	E.	77 5 20	3100	75 37 10	3102	74 9 3	3106	72 41 0	3108
	Jupiter	E.	96 28 3	3061	94 59 6	3065	93 30 13	3066	92 1 22	3068
	Spica	E.	99 54 2	3069	98 25 15	3072	96 56 31	3074	95 27 50	3076
22	SUN	W.	52 58 18	3445	54 19 44	3444	55 41 11	3443	57 2 39	3441
	Regulus	E.	34 27 3	3148	32 59 51	3153	31 32 45	3158	30 5 46	3165
	Saturn	E.	65 21 21	3116	63 53 31	3116	62 25 41	3117	60 57 52	3117
	Jupiter	E.	84 37 32	3072	83 8 48	3072	81 40 4	3072	80 11 20	3070
	Spica	E.	88 4 46	3078	86 36 10	3078	85 7 34	3078	83 38 57	3077
23	SUN	W.	63 50 34	3428	65 12 19	3424	66 34 8	3419	67 56 3	3414
	Venus	W.	26 27 7	3563	27 46 0	3573	29 5 4	3563	30 24 20	3562
	Mars	W.	20 44 33	3401	22 6 48	3385	23 29 22	3371	24 52 12	3358
	Saturn	E.	53 38 43	3114	52 10 51	3113	50 42 57	3110	49 15 0	3110
	Jupiter	E.	72 47 10	3080	71 18 11	3057	69 49 9	3053	68 20 2	3049
	Spica	E.	76 15 21	3054	74 46 27	3050	73 17 29	3056	71 48 26	3052
24	SUN	W.	74 47 16	3381	76 9 54	3373	77 32 41	3365	78 55 37	3356
	Venus	W.	37 3 19	3503	38 23 40	3493	39 44 12	3483	41 4 56	3471
	Mars	W.	31 49 58	3298	33 14 11	3287	34 38 38	3276	36 3 17	3265
	Pollux	W.	28 36 57	3334	30 0 29	3299	31 24 42	3289	32 49 30	3241
	Saturn	E.	41 54 46	3100	40 26 36	3098	38 58 24	3096	37 30 10	3095

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
9	SUN	E.	93° 56' 45"	2644	92° 18' 50"	2655	90° 41' 9"	2665	89° 3' 42"	2675
10	Antares	W.	81 26 24	2426	83 9 22	2435	84 52 7	2445	86 34 38	2454
	α Aquilæ	W.	36 27 43	2691	37 41 12	2788	38 56 27	2698	40 13 16	2690
	SUN	E.	80 59 55	2727	79 23 51	2738	77 48 1	2748	76 12 25	2768
11	Antares	W.	95 3 49	2503	96 44 58	2512	98 25 54	2522	100 6 37	2532
	α Aquilæ	W.	46 55 20	2565	48 18 28	2590	49 42 16	2599	51 6 40	2592
	SUN	E.	68 17 48	2610	66 43 33	2620	65 9 31	2621	63 35 43	2641
12	Antares	W.	108 26 49	2580	110 6 12	2590	111 45 21	2599	113 24 18	2608
	α Aquilæ	W.	58 15 22	2173	59 42 4	2161	61 9 0	2162	62 36 7	2144
	SUN	E.	55 49 58	2691	54 17 28	2901	52 45 10	2911	51 13 5	2920
13	α Aquilæ	W.	69 53 27	2125	71 21 6	2124	72 48 46	2125	74 16 25	2127
	Fomalhaut	W.	44 38 9	2712	45 54 43	2663	47 12 9	2619	48 30 23	2660
	SUN	E.	43 35 45	2669	42 4 54	2979	40 34 15	2989	39 3 48	2998
14	α Aquilæ	W.	81 33 56	2145	83 1 11	2150	84 28 20	2157	85 55 21	2163
	Fomalhaut	W.	55 10 39	2444	56 32 6	2426	57 53 53	2411	59 15 57	2396
	SUN	E.	31 34 32	2648	30 5 16	2656	28 36 12	2655	27 7 20	2675
19	SUN	W.	25 41 4	2392	27 3 41	2397	28 26 12	2392	29 48 36	2399
	Regulus	E.	63 51 54	2644	62 22 36	2651	60 53 26	2665	59 24 23	2692
	Saturn	E.	94 49 49	2647	93 20 34	2662	91 51 25	2657	90 22 23	2692
20	SUN	W.	36 39 12	2422	38 1 4	2425	39 22 52	2429	40 44 36	2432
	Regulus	E.	52 0 55	2691	50 32 34	2695	49 4 18	2101	47 36 9	2105
	Saturn	E.	82 58 43	2685	81 30 15	2689	80 1 52	2693	78 33 34	2695
	Jupiter	E.	102 24 25	2660	100 55 14	2653	99 26 7	2655	97 57 3	2656
21	SUN	W.	47 32 30	2443	48 53 58	2444	50 15 25	2444	51 36 52	2445
	Regulus	E.	40 16 50	2129	38 49 15	2133	37 21 45	2139	35 54 21	2145
	Saturn	E.	71 13 0	2110	69 45 2	2112	68 17 7	2112	66 49 13	2114
	Jupiter	E.	90 32 33	2699	89 3 46	2671	87 35 1	2671	86 6 16	2672
	Spica	E.	93 59 11	2677	92 30 33	2677	91 1 57	2678	89 33 21	2679
22	SUN	W.	58 24 9	2439	59 45 41	2438	61 7 15	2434	62 28 53	2431
	Regulus	E.	28 38 55	2173	27 12 13	2181	25 45 41	2191	24 19 21	2203
	Saturn	E.	59 30 3	2117	58 2 14	2116	56 34 24	2116	55 6 34	2115
	Jupiter	E.	78 42 34	2699	77 13 47	2667	75 44 57	2665	74 16 5	2663
	Spica	E.	82 10 19	2675	80 41 39	2673	79 12 56	2670	77 44 10	2668
23	SUN	W.	69 18 4	2408	70 40 11	2402	72 2 25	2395	73 24 47	2399
	Venus	W.	31 43 47	2543	33 3 24	2534	34 23 11	2523	35 43 10	2514
	Mars	W.	26 15 17	2345	27 38 37	2333	29 2 10	2321	30 25 57	2309
	Saturn	E.	47 47 2	2108	46 19 2	2105	44 50 59	2104	43 22 54	2101
	Jupiter	E.	66 50 50	2645	65 21 33	2640	63 52 10	2634	62 22 40	2629
	Spica	E.	70 19 17	2647	68 50 2	2641	67 20 40	2635	65 51 11	2629
24	SUN	W.	80 18 44	2346	81 42 2	2337	83 5 31	2326	84 29 12	2315
	Venus	W.	42 25 52	2460	43 47 1	2448	45 8 23	2437	46 29 58	2424
	Mars	W.	37 28 10	2253	38 53 17	2242	40 18 37	2229	41 44 12	2217
	Pollux	W.	34 14 51	2214	35 40 44	2198	37 7 8	2184	38 34 0	2142
	Saturn	E.	36 1 54	2694	34 33 37	2694	33 5 20	2695	31 37 4	2695

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Dif.	IIIh.	P. L. of Dif.	VIh.	P. L. of Dif.	IXh.	P. L. of Dif.
24	Jupiter	E.	60° 53' 3	3023	59° 23' 19	3018	57° 53' 28	3010	56° 23' 28	3008
	Spica	E.	64 21 34	3022	62 51 49	3016	61 21 55	3007	59 51 51	2999
25	SUN	W.	85 53 6	3304	87 17 13	3303	88 41 33	3300	90 6 8	3297
	Venus	W.	47 51 47	3411	49 13 51	3399	50 36 9	3396	51 58 43	3373
	Mars	W.	43 10 1	3204	44 36 5	3192	46 2 24	3178	47 28 59	3166
	Pollux	W.	40 1 19	3190	41 29 4	3100	42 57 14	3079	44 25 49	3040
	Jupiter	E.	48 51 8	2963	47 20 9	2964	45 48 59	2945	44 17 37	2936
	Spica	E.	52 18 48	2962	50 47 35	2941	49 16 8	2930	47 44 27	2919
	Antares	E.	97 46 35	2963	96 15 36	2962	94 44 23	2941	93 12 56	2929
26	SUN	W.	97 12 58	3197	98 39 11	3182	100 5 42	3166	101 32 32	3160
	Venus	W.	58 55 36	3206	60 19 52	3200	61 44 27	3204	63 9 21	3247
	Mars	W.	54 46 5	3092	56 14 24	3077	57 43 2	3061	59 11 59	3045
	Pollux	W.	51 54 44	2964	53 25 42	2946	54 57 3	2927	56 28 47	2909
	Jupiter	E.	36 37 49	2988	35 5 15	2980	33 32 30	2970	31 59 33	2962
	Spica	E.	40 2 14	2965	38 28 57	2942	36 55 23	2928	35 21 31	2913
	Antares	E.	85 31 47	2965	83 58 43	2960	82 25 20	2936	80 51 39	2921
27	SUN	W.	108 51 40	3065	110 20 33	3047	111 49 48	3029	113 19 25	3009
	Venus	W.	70 18 53	3159	71 45 51	3140	73 13 12	3122	74 40 55	3102
	Mars	W.	66 41 50	2961	68 12 52	2942	69 44 17	2924	71 16 5	2906
	Pollux	W.	64 13 25	2916	65 47 33	2796	67 22 6	2778	68 57 3	2760
	Regulus	W.	27 11 35	2927	28 45 28	2901	30 19 55	2776	31 54 54	2762
	Spica	E.	27 27 16	2798	25 51 27	2722	24 15 17	2707	22 38 47	2692
	Antares	E.	72 58 20	2744	71 22 38	2727	69 46 34	2711	68 10 9	2694
28	SUN	W.	120 53 26	2914	122 25 27	2906	123 57 52	2875	125 30 43	2865
	Venus	W.	82 5 24	3006	83 35 31	2986	85 6 2	2966	86 36 58	2946
	Mars	W.	79 0 59	2912	80 35 11	2798	82 9 48	2774	83 44 50	2765
	Pollux	W.	76 58 5	2963	78 35 34	2945	80 13 28	2926	81 51 48	2907
	Regulus	W.	39 57 35	2939	41 35 37	2918	43 14 7	2897	44 53 6	2876
	Antares	E.	60 2 19	2908	58 23 35	2901	56 44 27	2873	55 4 55	2856
29	Venus	W.	94 17 59	2945	95 51 28	2926	97 25 22	2906	98 59 42	2787
	Mars	W.	91 46 20	2659	93 23 55	2640	95 1 56	2621	96 40 22	2603
	Pollux	W.	90 9 55	2614	91 50 49	2496	93 32 8	2478	95 13 52	2460
	Regulus	W.	53 15 7	2475	54 56 55	2456	56 39 11	2436	58 21 54	2417
	Saturn	W.	23 9 39	2970	24 46 59	2924	26 25 21	2864	28 4 38	2846
	Antares	E.	46 41 16	2470	44 59 21	2453	43 17 2	2437	41 34 20	2422
	α Aquilæ	E.	99 32 11	2963	97 59 30	2961	96 26 21	2939	94 52 44	2919
30	Regulus	W.	67 2 10	2326	68 47 31	2309	70 33 18	2292	72 19 29	2276
	Saturn	W.	36 32 41	2400	38 16 16	2376	40 0 25	2363	41 45 7	2331
	Jupiter	W.	17 38 15	2491	19 19 41	2442	21 2 16	2399	22 45 52	2364
	Antares	E.	32 55 29	2351	31 10 44	2340	29 25 43	2331	27 40 29	2324
	α Aquilæ	E.	86 58 28	2732	85 22 31	2717	83 46 14	2704	82 9 40	2692
31	Regulus	W.	81 16 16	2300	83 4 43	2187	84 53 30	2174	86 42 37	2161
	Saturn	W.	50 36 4	2237	52 23 30	2222	54 11 31	2206	55 59 50	2191
	Jupiter	W.	31 35 0	2236	33 22 36	2216	35 10 41	2197	36 59 13	2180
	Spica	W.	27 14 0	2187	29 2 47	2173	30 51 55	2169	32 41 24	2146
	α Aquilæ	E.	74 3 16	2651	72 25 30	2647	70 47 39	2644	69 9 44	2644
	Fomalhaut	E.	101 17 5	2676	99 39 52	2666	98 2 13	2638	96 24 10	2622

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from	Diff. for 1 hour.	
		Apparent Right Ascension.		Diff. for 1 hour.	Apparent Declination.		Diff. for 1 hour.				Semi-diameter.
		^h ^m ^s	^s		[°] ['] ["]	["]					
Mon.	1	4 35 20.85	10.220	N.22° 1' 47.1	20.63	15 48.35	68.40	2 32.73	0.364		
Tues.	2	4 39 26.36	10.237	22 9 51.0	19.67	15 48.22	68.46	2 23.80	0.380		
Wed.	3	4 43 32.27	10.253	22 17 31.8	18.69	15 48.09	68.51	2 14.48	0.396		
Thur.	4	4 47 38.56	10.269	22 24 49.3	17.72	15 47.96	68.56	2 4.78	0.411		
Fri.	5	4 51 45.22	10.284	22 31 43.3	16.74	15 47.84	68.61	1 54.71	0.426		
Sat.	6	4 55 52.23	10.298	22 38 13.6	15.76	15 47.72	68.65	1 44.29	0.441		
Sun.	7	4 59 59.58	10.311	22 44 20.2	14.77	15 47.60	68.69	1 33.53	0.454		
Mon.	8	5 4 7.24	10.324	22 50 3.0	13.78	15 47.48	68.73	1 22.45	0.467		
Tues.	9	5 8 15.22	10.336	22 55 21.7	12.78	15 47.37	68.77	1 11.07	0.479		
Wed.	10	5 12 23.47	10.347	23 0 16.2	11.77	15 47.26	68.80	0 59.41	0.490		
Thur.	11	5 16 31.96	10.357	23 4 46.5	10.76	15 47.16	68.83	0 47.51	0.500		
Fri.	12	5 20 40.68	10.367	23 8 52.5	9.74	15 47.06	68.86	0 35.38	0.510		
Sat.	13	5 24 49.62	10.375	23 12 33.9	8.71	15 46.97	68.89	0 23.04	0.518		
Sun.	14	5 28 58.76	10.382	23 15 50.7	7.69	15 46.88	68.91	0 10.50	0.526		
Mon.	15	5 33 8.04	10.387	23 18 42.9	6.66	15 46.80	68.93	0 2.20	0.532		
Tues.	16	5 37 17.46	10.392	23 21 10.5	5.64	15 46.73	68.94	0 15.02	0.537		
Wed.	17	5 41 26.98	10.395	23 23 13.4	4.60	15 46.66	68.95	0 27.94	0.540		
Thur.	18	5 45 36.57	10.398	23 24 51.6	3.57	15 46.59	68.96	0 40.94	0.543		
Fri.	19	5 49 46.20	10.399	23 26 5.0	2.53	15 46.53	68.97	0 53.98	0.544		
Sat.	20	5 53 55.86	10.400	23 26 53.6	1.50	15 46.48	68.97	1 7.05	0.545		
Sun.	21	5 58 5.51	10.399	23 27 17.3	0.47	15 46.43	68.97	1 20.11	0.544		
Mon.	22	6 2 15.12	10.397	23 27 16.2	0.56	15 46.38	68.97	1 33.13	0.542		
Tues.	23	6 6 24.68	10.394	23 26 50.4	1.59	15 46.34	68.97	1 46.10	0.539		
Wed.	24	6 10 34.15	10.391	23 25 59.8	2.62	15 46.31	68.96	1 58.98	0.535		
Thur.	25	6 14 43.53	10.386	23 24 44.6	3.65	15 46.28	68.94	2 11.76	0.530		
Fri.	26	6 18 52.78	10.381	23 23 4.7	4.68	15 46.25	68.92	2 24.41	0.524		
Sat.	27	6 23 1.88	10.374	23 21 0.1	5.71	15 46.23	68.90	2 36.91	0.517		
Sun.	28	6 27 10.80	10.366	23 18 30.8	6.73	15 46.21	68.88	2 49.25	0.510		
Mon.	29	6 31 19.53	10.357	23 15 37.0	7.75	15 46.19	68.86	3 1.40	0.501		
Tues.	30	6 35 28.06	10.348	23 12 18.8	8.77	15 46.17	68.83	3 13.33	0.492		
Wed.	31	6 39 36.35	10.338	N.23 8 36.2	9.78	15 46.16	68.80	3 25.03	0.482		

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to		Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	subtracted from Mean Time.			
Mon.	1	^h 4 ^m 35 ^s 21.29	10.220	N. 22° 1' 48.1"	20.63	^m 2 ^s 32.74	^s 0.364	^h 4 ^m 37 ^s 54.03	
Tues.	2	4 39 26.78	10.237	22 9 51.9	19 67	2 23.81	0.380	4 41 50.59	
Wed.	3	4 43 32.66	10.253	22 17 32.6	18.69	2 14.49	0.396	4 45 47.15	
Thur.	4	4 47 38.92	10.269	22 24 50.0	17.72	2 4.79	0.411	4 49 43.71	
Fri.	5	4 51 45.55	10.284	22 31 43.9	16.74	1 54.72	0.426	4 53 40.27	
Sat.	6	4 55 52.53	10.298	22 38 14.2	15.76	1 44.30	0.441	4 57 36.83	
Sun.	7	4 59 59.85	10.311	22 44 20.7	14.77	1 33.53	0.454	5 1 33.38	
Mon.	8	5 4 7.48	10.324	22 50 3.4	13.78	1 22.46	0.467	5 5 29.94	
Tues.	9	5 8 15.42	10.336	22 55 22.0	12.78	1 11.08	0.479	5 9 26.50	
Wed.	10	5 12 23.64	10.347	23 0 16.4	11.77	0 59.42	0.490	5 13 23.06	
Thur.	11	5 16 32.10	10.357	23 4 46.6	10.76	0 47.51	0.500	5 17 19.61	
Fri.	12	5 20 40.79	10.367	23 8 52.5	9.74	0 35.38	0.510	5 21 16.17	
Sat.	13	5 24 49.69	10.375	23 12 33.9	8.71	0 23.04	0.518	5 25 12.73	
Sun.	14	5 28 58.79	10.382	23 15 50.7	7.69	0 10.50	0.526	5 29 9.29	
Mon.	15	5 33 8.04	10.387	23 18 42.9	6.66	0 2.20	0.532	5 33 5.84	
Tues.	16	5 37 17.42	10.392	23 21 10.5	5.64	0 15.02	0.537	5 37 2.40	
Wed.	17	5 41 26.90	10.395	23 23 13.4	4.60	0 27.94	0.540	5 40 58.96	
Thur.	18	5 45 36.45	10.398	23 24 51.6	3.57	0 40.94	0.543	5 44 55.51	
Fri.	19	5 49 46.04	10.399	23 26 5.0	2.53	0 53.97	0.544	5 48 52.07	
Sat.	20	5 53 55.67	10.400	23 26 53.6	1.50	1 7.04	0.545	5 52 48.63	
Sun.	21	5 58 5.29	10.399	23 27 17.3	0.47	1 20.10	0.544	5 56 45.19	
Mon.	22	6 2 14.86	10.397	23 27 16.2	0.56	1 33.12	0.542	6 0 41.74	
Tues.	23	6 6 24.38	10.394	23 26 50.4	1.59	1 46.08	0.539	6 4 38.30	
Wed.	24	6 10 33.81	10.391	23 25 59.9	2.62	1 58.96	0.535	6 8 34.86	
Thur.	25	6 14 43.15	10.386	23 24 44.7	3.65	2 11.74	0.530	6 12 31.41	
Fri.	26	6 18 52.36	10.381	23 23 4.8	4.68	2 24.39	0.524	6 16 27.97	
Sat.	27	6 23 1.42	10.374	23 21 0.3	5.71	2 36.89	0.517	6 20 24.53	
Sun.	28	6 27 10.31	10.366	23 18 31.1	6.73	2 49.22	0.510	6 24 21.09	
Mon.	29	6 31 19.01	10.357	23 15 37.4	7.75	3 1.37	0.501	6 28 17.64	
Tues.	30	6 35 27.50	10.348	23 12 19.3	8.77	3 13.30	0.492	6 32 14.20	
Wed.	31	6 39 35.76	10.338	N. 23 8 36.8	9.78	3 25.00	0.482	6 36 10.76	

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	152	70° 27' 18.2	26' 42.2	143.60	—0.08	0.0062017	25.9	19 18 55.58	
2	153	71 24 44.2	24 8.0	143.56	+0.06	.0062630	25.4	19 14 59.67	
3	154	72 22 9.2	21 32.8	143.52	0.18	.0063230	24.9	19 11 3.75	
4	155	73 19 33.4	18 56.8	143.49	0.30	.0063818	24.3	19 7 7.84	
5	156	74 16 56.9	16 20.2	143.46	0.40	.0064395	23.7	19 3 11.93	
6	157	75 14 19.7	13 42.8	143.44	0.48	.0064957	23.1	18 59 16.02	
7	158	76 11 41.9	11 4.8	143.41	0.52	.0065503	22.4	18 55 20.11	
8	159	77 9 3.7	8 26.4	143.39	0.54	.0066031	21.6	18 51 24.19	
9	160	78 6 24.9	5 47.4	143.37	0.51	.0066541	20.8	18 47 28.28	
10	161	79 3 45.6	3 8.0	143.35	0.47	.0067033	20.0	18 43 32.37	
11	162	80 1 5.9	0 28.2	143.34	0.38	.0067503	19.1	18 39 36.46	
12	163	80 58 25.7	57 47.8	143.32	0.28	.0067951	18.2	18 35 40.55	
13	164	81 55 45.1	55 7.0	143.30	0.18	.0068376	17.2	18 31 44.63	
14	165	82 53 3.9	52 25.6	143.28	+0.06	.0068777	16.2	18 27 48.72	
15	166	83 50 22.3	49 43.9	143.26	—0.07	.0069152	15.1	18 23 52.81	
16	167	84 47 40.2	47 1.6	143.24	0.20	.0069501	14.0	18 19 56.90	
17	168	85 44 57.6	44 18.8	143.21	0.33	.0069824	12.9	18 16 0.99	
18	169	86 42 14.5	41 35.5	143.19	0.42	.0070121	11.8	18 12 5.08	
19	170	87 39 30.7	38 51.5	143.16	0.50	.0070393	10.8	18 8 9.17	
20	171	88 36 46.3	36 7.0	143.14	0.56	.0070640	9.8	18 4 13.26	
21	172	89 34 1.3	33 21.9	143.11	0.57	.0070863	8.9	18 0 17.35	
22	173	90 31 15.6	30 36.0	143.09	0.56	.0071063	7.9	17 56 21.44	
23	174	91 28 29.3	27 49.5	143.06	0.52	.0071242	7.0	17 52 25.52	
24	175	92 25 42.6	25 2.6	143.04	0.43	.0071400	6.1	17 48 29.61	
25	176	93 22 55.3	22 15.2	143.01	0.34	.0071538	5.3	17 44 33.70	
26	177	94 20 7.4	19 27.1	142.99	0.22	.0071657	4.5	17 40 37.79	
27	178	95 17 19.0	16 38.5	142.97	—0.09.	.0071759	3.9	17 36 41.88	
28	179	96 14 30.3	13 49.6	142.96	+0.06	.0071845	3.3	17 32 45.97	
29	180	97 11 41.3	11 0.4	142.95	0.19	.0071916	2.7	17 28 50.06	
30	181	98 8 52.1	8 11.0	142.94	0.32	.0071973	2.1	17 24 54.15	
31	182	99 6 2.8	5 21.5	142.94	+0.43	0.0072017	1.5	17 20 58.24	

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	16' 30.4	16' 34.1	60' 28.3	+1.27	60' 41.7	+0.94	11 ^h 59.0 ^m	2.61	14.8 ^d
2	16 36.5	16 37.8	60 50.9	+0.59	60 55.7	+0.22	13 2.3	2.62	15.8
3	16 38.0	16 36.9	60 56.2	-0.14	60 52.4	-0.49	14 4.9	2.55	16.8
4	16 34.8	16 31.6	60 44.5	0.81	60 32.9	1.10	15 4.7	2.42	17.8
5	16 27.6	16 22.8	60 18.0	1.35	60 0.4	1.55	16 0.8	2.27	18.8
6	16 17.4	16 11.7	59 40.8	1.70	59 19.5	1.82	16 53.4	2.13	19.8
7	16 5.6	15 59.4	58 57.2	1.88	58 34.4	1.91	17 43.2	2.03	20.8
8	15 53.1	15 47.0	58 11.4	1.90	57 48.7	1.87	18 31.1	1.98	21.8
9	15 40.9	15 35.1	57 26.6	1.81	57 5.2	1.74	19 18.1	1.96	22.8
10	15 29.5	15 24.3	56 44.8	1.66	56 25.4	1.56	20 5.2	1.97	23.8
11	15 19.3	15 14.7	56 7.2	1.47	55 50.2	1.37	20 52.8	2.00	24.8
12	15 10.4	15 6.4	55 34.3	1.27	55 19.8	1.16	21 41.3	2.04	25.8
13	15 2.7	14 59.4	55 6.4	1.06	54 54.2	0.97	22 30.6	2.06	26.8
14	14 56.4	14 53.7	54 43.1	0.87	54 33.3	0.77	23 20.2	2.06	27.8
15	14 51.4	14 49.3	54 24.6	0.68	54 17.0	0.58	6		28.8
16	14 47.6	14 46.2	54 10.7	0.48	54 5.5	0.37	0 9.5	2.03	0.2
17	14 45.1	14 44.5	54 1.7	0.26	53 59.2	-0.15	0 57.8	1.98	1.2
18	14 44.2	14 44.3	53 58.2	-0.02	53 58.7	+0.11	1 44.7	1.92	2.2
19	14 44.9	14 46.0	54 0.8	+0.26	54 4.8	0.41	2 29.9	1.85	3.2
20	14 47.6	14 49.7	54 10.7	0.57	54 18.6	0.74	3 13.7	1.80	4.2
21	14 52.4	14 55.7	54 28.5	0.92	54 40.7	1.10	3 56.5	1.77	5.2
22	14 59.6	15 4.1	54 55.0	1.29	55 11.6	1.47	4 39.0	1.78	6.2
23	15 9.2	15 15.0	55 30.3	1.65	55 51.2	1.82	5 22.7	1.83	7.2
24	15 21.2	15 27.9	56 14.0	1.98	56 38.8	2.12	6 6.7	1.91	8.2
25	15 35.0	15 42.6	57 5.0	2.25	57 32.7	2.34	6 53.8	2.04	9.2
26	15 50.3	15 58.2	58 1.2	2.39	58 30.1	2.40	7 44.5	2.20	10.2
27	16 6.0	16 13.6	58 58.8	2.36	59 26.7	2.26	8 39.4	2.38	11.2
28	16 20.8	16 27.4	59 53.1	2.10	60 17.2	1.89	9 38.6	2.53	12.2
29	16 33.1	16 37.9	60 38.4	1.62	60 55.9	1.29	10 41.1	2.63	13.2
30	16 41.6	16 43.9	61 9.4	0.92	61 18.1	+0.53	11 44.8	2.63	14.2
31	16 45.0	16 44.7	61 22.0	+0.12	61 20.9	-0.29	12 47.4	2.55	15.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 1.					WEDNESDAY 3.				
0	^h 16 ^m 6 ^s 58.05	2.6383	S. 21° 12' 42.6"	3.604	0	^h 18 ^m 15 ^s 42.85	2.6700	S. 21° 1' 18.9"	4.118
1	16 9 36.47	2.6423	21 16 14.3	3.452	1	18 18 22.97	2.6671	20 57 7.2	4.273
2	16 12 15.12	2.6461	21 19 36.9	3.300	2	18 21 2.91	2.6641	20 52 46.1	4.428
3	16 14 54.00	2.6498	21 22 50.3	3.147	3	18 23 42.66	2.6610	20 48 15.8	4.581
4	16 17 33.10	2.6535	21 25 54.5	2.993	4	18 26 22.23	2.6578	20 43 36.4	4.733
5	16 20 12.42	2.6570	21 28 49.4	2.838	5	18 29 1.60	2.6544	20 38 47.8	4.885
6	16 22 51.94	2.6603	21 31 35.0	2.682	6	18 31 40.76	2.6510	20 33 50.2	5.036
7	16 25 31.65	2.6634	21 34 11.2	2.525	7	18 34 19.72	2.6475	20 28 43.5	5.186
8	16 28 11.55	2.6664	21 36 38.0	2.368	8	18 36 58.46	2.6437	20 23 27.9	5.334
9	16 30 51.63	2.6694	21 38 55.3	2.209	9	18 39 36.97	2.6399	20 18 3.4	5.481
10	16 33 31.89	2.6723	21 41 3.1	2.050	10	18 42 15.25	2.6361	20 12 30.1	5.627
11	16 36 12.31	2.6750	21 43 1.3	1.890	11	18 44 53.30	2.6322	20 6 48.1	5.773
12	16 38 52.89	2.6776	21 44 49.9	1.739	12	18 47 31.11	2.6280	20 0 57.4	5.916
13	16 41 33.62	2.6799	21 46 28.8	1.588	13	18 50 8.66	2.6237	19 54 58.1	6.060
14	16 44 14.48	2.6821	21 47 58.1	1.407	14	18 52 45.96	2.6194	19 48 50.3	6.201
15	16 46 55.48	2.6843	21 49 17.7	1.246	15	18 55 22.99	2.6150	19 42 34.0	6.343
16	16 49 36.60	2.6863	21 50 27.6	1.083	16	18 57 59.76	2.6106	19 36 9.3	6.481
17	16 52 17.83	2.6880	21 51 27.7	0.920	17	19 0 36.26	2.6060	19 29 36.3	6.619
18	16 54 59.16	2.6897	21 52 18.0	0.757	18	19 3 12.48	2.6013	19 22 55.1	6.764
19	16 57 40.59	2.6913	21 52 58.6	0.595	19	19 5 48.42	2.5966	19 16 5.8	6.899
20	17 0 22.11	2.6927	21 53 29.4	0.431	20	19 8 24.07	2.5918	19 9 8.4	7.033
21	17 3 3.71	2.6938	21 53 50.3	0.266	21	19 10 59.43	2.5869	19 2 3.0	7.166
22	17 5 45.37	2.6948	21 54 1.3	0.102	22	19 13 34.50	2.5820	18 54 49.7	7.297
23	17 8 27.09	2.6957	S. 21° 54' 2.5"	0.062	23	19 16 9.27	2.5769	S. 18° 47' 28.6"	7.417
TUESDAY 2.					THURSDAY 4.				
0	^h 17 ^m 11 ^s 8.86	2.6966	S. 21° 53' 53.8"	0.237	0	^h 19 ^m 18 ^s 43.73	2.5717	S. 18° 39' 59.7"	7.545
1	17 13 50.67	2.6971	21 53 35.2	0.393	1	19 21 17.88	2.5666	18 32 23.2	7.671
2	17 16 32.51	2.6976	21 53 6.7	0.556	2	19 23 51.72	2.5613	18 24 39.2	7.796
3	17 19 14.38	2.6979	21 52 28.3	0.722	3	19 26 25.24	2.5561	18 16 47.7	7.920
4	17 21 56.26	2.6980	21 51 40.1	0.886	4	19 28 58.45	2.5507	18 8 48.8	8.042
5	17 24 38.14	2.6980	21 50 42.0	1.051	5	19 31 31.33	2.5452	18 0 42.6	8.163
6	17 27 20.02	2.6978	21 49 34.0	1.216	6	19 34 3.88	2.5396	17 52 29.3	8.281
7	17 30 1.88	2.6976	21 48 16.1	1.381	7	19 36 36.11	2.5344	17 44 8.9	8.399
8	17 32 43.72	2.6971	21 46 48.3	1.545	8	19 39 8.01	2.5289	17 35 41.4	8.516
9	17 35 25.53	2.6965	21 45 10.7	1.709	9	19 41 39.58	2.5233	17 27 7.0	8.630
10	17 38 7.30	2.6957	21 43 23.2	1.873	10	19 44 10.81	2.5177	17 18 25.8	8.743
11	17 40 49.02	2.6948	21 41 25.9	2.037	11	19 46 41.70	2.5120	17 9 37.9	8.854
12	17 43 30.68	2.6937	21 39 18.8	2.200	12	19 49 12.25	2.5063	17 0 43.3	8.964
13	17 46 12.27	2.6926	21 37 1.9	2.363	13	19 51 42.46	2.5006	16 51 42.2	9.072
14	17 48 53.78	2.6912	21 34 35.2	2.526	14	19 54 12.32	2.4948	16 42 34.7	9.178
15	17 51 35.21	2.6897	21 31 58.8	2.688	15	19 56 41.84	2.4891	16 33 20.8	9.283
16	17 54 16.55	2.6881	21 29 12.7	2.849	16	19 59 11.01	2.4833	16 24 0.7	9.387
17	17 56 57.78	2.6863	21 26 16.9	3.010	17	20 1 39.83	2.4774	16 14 34.4	9.486
18	17 59 38.90	2.6843	21 23 11.5	3.171	18	20 4 8.30	2.4717	16 5 2.1	9.587
19	18 2 19.90	2.6823	21 19 56.5	3.329	19	20 6 36.43	2.4659	15 55 23.9	9.685
20	18 5 0.78	2.6802	21 16 32.0	3.488	20	20 9 4.21	2.4600	15 45 39.8	9.783
21	18 7 41.52	2.6779	21 12 57.9	3.647	21	20 11 31.63	2.4541	15 35 49.9	9.878
22	18 10 22.12	2.6754	21 9 14.3	3.805	22	20 13 58.70	2.4482	15 25 54.4	9.973
23	18 13 2.57	2.6728	21 5 21.3	3.962	23	20 16 25.42	2.4424	15 15 53.3	10.068
24	18 15 42.85	2.6700	S. 21° 1' 18.9"	4.118	24	20 18 51.79	2.4365	S. 15° 5' 46.8"	10.163

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 5.					SUNDAY 7.				
0	^h 20 ^m 18 ^s 51.79	2.4366	S. 15° 5' 46.8"	10.153	0	^h 22 ^m 9 ^s 27.51	2.1872	S. 5° 44' 51.4"	12.639
1	20 21 17.80	2.4306	14 55 34.9	10.242	1	22 11 38.62	2.1892	5 32 12.6	12.655
2	20 23 43.46	2.4247	14 45 17.7	10.330	2	22 13 49.49	2.1792	5 19 32.8	12.670
3	20 26 8.77	2.4188	14 34 55.4	10.416	3	22 16 0.12	2.1753	5 6 52.2	12.684
4	20 28 33.72	2.4129	14 24 28.0	10.499	4	22 18 10.52	2.1715	4 54 10.7	12.697
5	20 30 58.32	2.4071	14 13 55.6	10.580	5	22 20 20.70	2.1678	4 41 28.5	12.708
6	20 33 22.57	2.4012	14 3 18.4	10.660	6	22 22 30.66	2.1641	4 28 45.7	12.718
7	20 35 46.47	2.3954	13 52 36.4	10.738	7	22 24 40.39	2.1604	4 16 2.3	12.728
8	20 38 10.02	2.3896	13 41 49.8	10.815	8	22 26 49.91	2.1569	4 3 18.3	12.737
9	20 40 33.22	2.3838	13 30 58.6	10.891	9	22 28 59.22	2.1534	3 50 33.9	12.743
10	20 42 56.08	2.3781	13 20 2.9	10.965	10	22 31 8.32	2.1500	3 37 49.2	12.748
11	20 45 18.59	2.3723	13 9 2.8	11.037	11	22 33 17.22	2.1467	3 25 4.1	12.753
12	20 47 40.76	2.3666	12 57 58.4	11.108	12	22 35 25.92	2.1433	3 12 18.8	12.757
13	20 50 2.58	2.3608	12 46 49.8	11.177	13	22 37 34.42	2.1401	2 59 33.3	12.759
14	20 52 24.06	2.3552	12 35 37.1	11.244	14	22 39 42.73	2.1369	2 46 47.7	12.759
15	20 54 45.20	2.3495	12 24 20.5	11.309	15	22 41 50.85	2.1338	2 34 2.2	12.756
16	20 57 6.00	2.3438	12 13 0.0	11.373	16	22 43 58.79	2.1308	2 21 16.8	12.756
17	20 59 26.46	2.3382	12 1 35.7	11.436	17	22 46 6.55	2.1278	2 8 31.4	12.755
18	21 1 46.59	2.3327	11 50 7.7	11.497	18	22 48 14.13	2.1249	1 55 46.2	12.752
19	21 4 6.39	2.3272	11 38 36.0	11.557	19	22 50 21.54	2.1221	1 43 1.2	12.748
20	21 6 25.86	2.3217	11 27 0.8	11.615	20	22 52 28.78	2.1193	1 30 16.5	12.742
21	21 8 45.00	2.3162	11 15 22.2	11.672	21	22 54 35.86	2.1166	1 17 32.2	12.734
22	21 11 3.81	2.3108	11 3 40.2	11.727	22	22 56 42.77	2.1139	1 4 48.4	12.726
23	21 13 22.30	2.3055	S. 10 51 55.0	11.779	23	22 58 49.53	2.1114	S. 0 52 5.1	12.717
SATURDAY 6.					MONDAY 8.				
0	21 15 40.47	2.3009	S. 10 40 6.7	11.831	0	23 0 56.14	2.1089	S. 0 39 22.4	12.707
1	21 17 58.32	2.2948	10 28 15.3	11.881	1	23 3 2.60	2.1065	0 26 40.3	12.696
2	21 20 15.85	2.2886	10 16 20.9	11.930	2	23 5 8.92	2.1041	0 13 58.9	12.683
3	21 22 33.07	2.2824	10 4 23.7	11.977	3	23 7 15.09	2.1017	S. 0 1 18.3	12.670
4	21 24 49.97	2.2762	9 52 23.7	12.023	4	23 9 21.12	2.0994	N. 0 11 21.5	12.656
5	21 27 6.57	2.2741	9 40 21.0	12.067	5	23 11 27.02	2.0972	0 24 0.5	12.642
6	21 29 22.86	2.2680	9 28 15.7	12.110	6	23 13 32.79	2.0951	0 36 38.5	12.628
7	21 31 38.85	2.2640	9 16 7.8	12.152	7	23 15 38.43	2.0930	0 49 15.5	12.607
8	21 33 54.54	2.2601	9 3 57.5	12.191	8	23 17 43.95	2.0910	1 1 51.4	12.589
9	21 36 9.94	2.2542	8 51 44.9	12.229	9	23 19 49.35	2.0891	1 14 26.2	12.571
10	21 38 25.04	2.2493	8 39 30.0	12.267	10	23 21 54.64	2.0872	1 26 59.9	12.551
11	21 40 39.85	2.2444	8 27 12.9	12.303	11	23 23 59.82	2.0854	1 39 32.3	12.529
12	21 42 54.37	2.2397	8 14 53.7	12.336	12	23 26 4.89	2.0837	1 52 3.4	12.507
13	21 45 8.61	2.2350	8 2 32.6	12.368	13	23 28 9.86	2.0820	2 4 33.1	12.483
14	21 47 22.57	2.2303	7 50 9.5	12.400	14	23 30 14.72	2.0803	2 17 1.4	12.460
15	21 49 36.25	2.2257	7 37 44.6	12.429	15	23 32 19.49	2.0787	2 29 28.3	12.436
16	21 51 49.66	2.2212	7 25 18.0	12.458	16	23 34 24.17	2.0772	2 41 53.7	12.410
17	21 54 2.80	2.2167	7 12 49.7	12.485	17	23 36 28.76	2.0757	2 54 17.5	12.382
18	21 56 15.67	2.2123	7 0 19.8	12.511	18	23 38 33.26	2.0743	3 6 39.6	12.354
19	21 58 28.28	2.2080	6 47 48.4	12.536	19	23 40 37.68	2.0730	3 19 0.0	12.326
20	22 0 40.63	2.2037	6 35 15.5	12.559	20	23 42 42.02	2.0718	3 31 18.7	12.297
21	22 2 52.72	2.1994	6 22 41.3	12.580	21	23 44 46.29	2.0706	3 43 35.6	12.266
22	22 5 4.56	2.1953	6 10 5.9	12.601	22	23 46 50.49	2.0694	3 55 50.6	12.234
23	22 7 16.16	2.1913	5 57 29.2	12.621	23	23 48 54.62	2.0682	4 8 3.7	12.202
24	22 9 27.51	2.1872	S. 5 44 51.4	12.639	24	23 50 58.68	2.0672	N. 4 20 14.8	12.168

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 9.					THURSDAY 11.				
0	^h 23 ^m 50 ^s 58.68	2.0673	N. 4° 20' 14.8"	12.168	0	^h 1 29 ^m 59.29	2.0760	N. 13° 10' 42.5"	9.841
1	23 53 2.69	2.0663	4 32 23.9	12.135	1	1 32 3.82	2.0760	13 20 18.8	9.870
2	23 55 6.64	2.0653	4 44 31.0	12.101	2	1 34 8.41	2.0771	13 29 50.9	9.490
3	23 57 10.53	2.0645	4 56 36.0	12.065	3	1 36 13.07	2.0792	13 39 18.7	9.427
4	23 59 14.38	2.0637	5 8 38.8	12.028	4	1 38 17.80	2.0794	13 48 42.2	9.366
5	0 1 18.18	2.0629	5 20 39.4	11.991	5	1 40 22.60	2.0806	13 58 1.3	9.301
6	0 3 21.93	2.0622	5 32 37.7	11.962	6	1 42 27.47	2.0818	14 7 16.0	9.208
7	0 5 25.64	2.0616	5 44 33.7	11.913	7	1 44 32.41	2.0830	14 16 26.3	9.134
8	0 7 29.32	2.0611	5 56 27.3	11.873	8	1 46 37.43	2.0842	14 25 32.1	9.066
9	0 9 32.97	2.0606	6 8 18.5	11.832	9	1 48 42.52	2.0855	14 34 33.3	8.992
10	0 11 36.58	2.0600	6 20 7.2	11.790	10	1 50 47.69	2.0868	14 43 30.0	8.906
11	0 13 40.17	2.0596	6 31 53.3	11.747	11	1 52 52.94	2.0881	14 52 22.1	8.830
12	0 15 43.73	2.0592	6 43 36.9	11.706	12	1 54 58.26	2.0893	15 1 9.6	8.753
13	0 17 47.27	2.0588	6 55 17.9	11.661	13	1 57 3.66	2.0907	15 9 52.4	8.674
14	0 19 50.79	2.0586	7 6 56.2	11.616	14	1 59 9.14	2.0921	15 18 30.5	8.596
15	0 21 54.30	2.0584	7 18 31.8	11.571	15	2 1 14.71	2.0934	15 27 3.8	8.516
16	0 23 57.80	2.0582	7 30 4.7	11.524	16	2 3 20.35	2.0948	15 35 32.4	8.436
17	0 26 1.29	2.0581	7 41 34.7	11.477	17	2 5 26.08	2.0962	15 43 56.1	8.356
18	0 28 4.77	2.0580	7 53 1.9	11.429	18	2 7 31.89	2.0976	15 52 15.0	8.274
19	0 30 8.25	2.0579	8 4 26.2	11.380	19	2 9 37.78	2.0988	16 0 29.0	8.192
20	0 32 11.72	2.0579	8 15 47.5	11.330	20	2 11 43.75	2.1002	16 8 38.1	8.110
21	0 34 15.20	2.0580	8 27 5.8	11.280	21	2 13 49.81	2.1017	16 16 42.2	8.027
22	0 36 18.69	2.0582	8 38 21.1	11.229	22	2 15 55.95	2.1031	16 24 41.3	7.943
23	0 38 22.18	2.0583	N. 8 49 33.3	11.177	23	2 18 2.18	2.1045	N. 16 32 35.4	7.859
WEDNESDAY 10.					FRIDAY 12.				
0	0 40 25.68	2.0586	N. 9 0 42.3	11.124	0	2 20 8.49	2.1060	N. 16 40 24.4	7.774
1	0 42 29.20	2.0587	9 11 48.1	11.070	1	2 22 14.89	2.1074	16 48 8.3	7.690
2	0 44 32.73	2.0590	9 22 50.7	11.017	2	2 24 21.38	2.1088	16 55 47.1	7.603
3	0 46 36.28	2.0593	9 33 50.1	10.963	3	2 26 27.95	2.1102	17 3 20.7	7.517
4	0 48 39.85	2.0597	9 44 46.2	10.907	4	2 28 34.61	2.1117	17 10 49.2	7.431
5	0 50 43.45	2.0602	9 55 38.9	10.849	5	2 30 41.35	2.1131	17 18 12.4	7.344
6	0 52 47.07	2.0606	10 6 28.1	10.792	6	2 32 48.18	2.1145	17 25 30.4	7.256
7	0 54 50.72	2.0611	10 17 13.9	10.734	7	2 34 55.09	2.1159	17 32 43.1	7.167
8	0 56 54.40	2.0616	10 27 56.2	10.676	8	2 37 2.09	2.1173	17 39 50.4	7.078
9	0 58 58.11	2.0622	10 38 35.0	10.617	9	2 39 9.17	2.1187	17 46 52.4	6.988
10	1 1 1.86	2.0628	10 49 10.2	10.556	10	2 41 16.34	2.1202	17 53 49.0	6.897
11	1 3 5.65	2.0633	10 59 41.7	10.496	11	2 43 23.60	2.1217	18 0 40.1	6.806
12	1 5 9.48	2.0642	11 10 9.6	10.434	12	2 45 30.94	2.1230	18 7 25.8	6.716
13	1 7 13.35	2.0649	11 20 33.8	10.372	13	2 47 38.36	2.1244	18 14 6.0	6.624
14	1 9 17.27	2.0657	11 30 54.2	10.309	14	2 49 45.87	2.1257	18 20 40.7	6.532
15	1 11 21.23	2.0664	11 41 10.8	10.245	15	2 51 53.45	2.1271	18 27 9.9	6.440
16	1 13 25.24	2.0672	11 51 23.6	10.181	16	2 54 1.12	2.1286	18 33 33.5	6.347
17	1 15 29.30	2.0681	12 1 32.5	10.116	17	2 56 8.87	2.1298	18 39 51.5	6.253
18	1 17 33.41	2.0690	12 11 37.4	10.049	18	2 58 16.70	2.1311	18 46 3.9	6.160
19	1 19 37.58	2.0699	12 21 38.4	9.983	19	3 0 24.60	2.1324	18 52 10.7	6.066
20	1 21 41.80	2.0708	12 31 35.4	9.916	20	3 2 32.59	2.1337	18 58 11.8	5.971
21	1 23 46.08	2.0718	12 41 28.3	9.849	21	3 4 40.65	2.1350	19 4 7.2	5.876
22	1 25 50.42	2.0728	12 51 17.1	9.780	22	3 6 48.79	2.1363	19 9 56.9	5.780
23	1 27 54.82	2.0739	13 1 1.9	9.712	23	3 8 57.01	2.1376	19 15 40.8	5.683
24	1 29 59.29	2.0750	N. 13 10 42.5	9.641	24	3 11 5.30	2.1388	N. 19 21 18.9	5.587

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 13.					MONDAY 15.				
0	3 11 5.30	2.1398	N.19 21 18.9	5.597	0	4 54 36.88	2.1606	N.21 52 30.6	0.639
1	3 13 13.66	2.1400	19 26 51.2	5.490	1	4 56 46.50	2.1600	21 53 5.8	0.583
2	3 15 22.10	2.1412	19 32 17.7	5.394	2	4 58 56.08	2.1604	21 53 34.6	0.427
3	3 17 30.61	2.1423	19 37 38.4	5.306	3	5 1 5.63	2.1608	21 53 57.1	0.322
4	3 19 39.18	2.1435	19 42 53.2	5.198	4	5 3 15.14	2.1602	21 54 13.2	0.216
5	3 21 47.83	2.1447	19 48 2.1	5.090	5	5 5 24.61	2.1674	21 54 23.0	0.111
6	3 23 56.54	2.1467	19 53 5.1	5.000	6	5 7 34.03	2.1697	21 54 26.5	0.006
7	3 26 5.31	2.1468	19 58 2.1	4.901	7	5 9 43.41	2.1668	21 54 23.7	0.099
8	3 28 14.15	2.1478	20 2 53.2	4.802	8	5 11 52.73	2.1649	21 54 14.6	0.204
9	3 30 23.05	2.1488	20 7 38.3	4.702	9	5 14 2.00	2.1640	21 53 59.2	0.309
10	3 32 32.01	2.1498	20 12 17.4	4.602	10	5 16 11.21	2.1631	21 53 37.5	0.414
11	3 34 41.03	2.1508	20 16 50.5	4.501	11	5 18 20.37	2.1622	21 53 9.5	0.519
12	3 36 50.11	2.1517	20 21 17.5	4.400	12	5 20 29.47	2.1611	21 52 35.2	0.623
13	3 38 59.24	2.1526	20 25 38.5	4.300	13	5 22 38.50	2.1600	21 51 54.7	0.727
14	3 41 8.42	2.1535	20 29 53.4	4.197	14	5 24 47.46	2.1608	21 51 7.9	0.832
15	3 43 17.66	2.1543	20 34 2.2	4.095	15	5 26 56.36	2.1477	21 50 14.9	0.936
16	3 45 26.95	2.1552	20 38 4.8	3.993	16	5 29 5.19	2.1466	21 49 15.6	1.040
17	3 47 36.29	2.1560	20 42 1.3	3.891	17	5 31 13.94	2.1468	21 48 10.1	1.143
18	3 49 45.67	2.1567	20 45 51.7	3.789	18	5 33 22.62	2.1439	21 46 58.4	1.246
19	3 51 55.09	2.1573	20 49 36.0	3.687	19	5 35 31.21	2.1426	21 45 40.6	1.348
20	3 54 4.55	2.1580	20 53 14.1	3.583	20	5 37 39.73	2.1412	21 44 16.6	1.452
21	3 56 14.05	2.1587	20 56 46.0	3.480	21	5 39 48.16	2.1398	21 42 46.4	1.554
22	3 58 23.59	2.1593	21 0 11.7	3.376	22	5 41 56.50	2.1388	21 41 10.1	1.656
23	4 0 33.17	2.1599	N.21 3 31.1	3.271	23	5 44 4.76	2.1368	N.21 39 27.7	1.758
SUNDAY 14.					TUESDAY 16.				
0	4 2 42.78	2.1606	N.21 6 44.3	3.168	0	5 46 12.93	2.1368	N.21 37 39.1	1.861
1	4 4 52.42	2.1600	21 9 51.3	3.064	1	5 48 21.00	2.1387	21 35 44.4	1.962
2	4 7 2.09	2.1613	21 12 52.0	2.960	2	5 50 28.97	2.1391	21 33 43.7	2.063
3	4 9 11.78	2.1617	21 15 46.5	2.866	3	5 52 36.85	2.1394	21 31 36.9	2.163
4	4 11 21.50	2.1621	21 18 34.7	2.761	4	5 54 44.63	2.1388	21 29 24.1	2.263
5	4 13 31.24	2.1624	21 21 16.6	2.646	5	5 56 52.30	2.1270	21 27 5.3	2.364
6	4 15 40.99	2.1626	21 23 52.2	2.541	6	5 58 59.87	2.1262	21 24 40.4	2.465
7	4 17 50.76	2.1630	21 26 21.5	2.436	7	6 1 7.33	2.1284	21 22 9.6	2.563
8	4 20 0.55	2.1632	21 28 44.5	2.331	8	6 3 14.68	2.1216	21 19 32.8	2.662
9	4 22 10.35	2.1633	21 31 1.2	2.226	9	6 5 21.92	2.1197	21 16 50.1	2.761
10	4 24 20.15	2.1634	21 33 11.6	2.120	10	6 7 29.05	2.1178	21 14 1.5	2.859
11	4 26 29.96	2.1636	21 35 15.6	2.014	11	6 9 36.06	2.1168	21 11 7.0	2.957
12	4 28 39.78	2.1637	21 37 13.3	1.909	12	6 11 42.95	2.1138	21 8 6.6	3.055
13	4 30 49.60	2.1637	21 39 4.7	1.803	13	6 13 49.72	2.1118	21 5 0.4	3.152
14	4 32 59.42	2.1636	21 40 49.7	1.697	14	6 15 56.37	2.1098	21 1 48.3	3.249
15	4 35 9.23	2.1634	21 42 28.4	1.592	15	6 18 2.90	2.1078	20 58 30.5	3.345
16	4 37 19.03	2.1632	21 44 0.7	1.486	16	6 20 9.31	2.1057	20 55 6.9	3.442
17	4 39 28.82	2.1631	21 45 26.7	1.380	17	6 22 15.59	2.1036	20 51 37.5	3.537
18	4 41 38.60	2.1629	21 46 46.3	1.274	18	6 24 21.74	2.1014	20 48 2.4	3.632
19	4 43 48.37	2.1627	21 47 59.6	1.168	19	6 26 27.76	2.0992	20 44 21.6	3.727
20	4 45 58.12	2.1623	21 49 6.5	1.062	20	6 28 33.65	2.0970	20 40 35.1	3.822
21	4 48 7.85	2.1619	21 50 7.0	0.956	21	6 30 39.40	2.0948	20 36 43.0	3.915
22	4 50 17.55	2.1615	21 51 1.2	0.851	22	6 32 45.02	2.0926	20 32 45.3	4.008
23	4 52 27.23	2.1611	21 51 49.1	0.745	23	6 34 50.51	2.0903	20 28 42.0	4.102
24	4 54 36.88	2.1606	N.21 52 30.6	0.639	24	6 36 55.86	2.0880	N.20 24 33.1	4.194

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 17.					FRIDAY 19.				
0	6 36 55.86	2.0880	N.20° 24' 33.1"	4.194	0	8 14 16.20	1.9673	N.15° 26' 33.2"	8.006
1	6 39 1.07	2.0887	20 20 18.7	4.287	1	8 16 14.17	1.9660	15 18 30.9	8.072
2	6 41 6.14	2.0893	20 15 58.7	4.378	2	8 18 12.00	1.9657	15 10 24.6	8.137
3	6 43 11.07	2.0899	20 11 33.3	4.469	3	8 20 9.69	1.9603	15 2 14.5	8.200
4	6 45 15.85	2.0785	20 7 2.4	4.560	4	8 22 7.24	1.9680	14 54 0.6	8.263
5	6 47 20.49	2.0762	20 2 26.1	4.650	5	8 24 4.65	1.9667	14 45 42.9	8.326
6	6 49 24.99	2.0738	19 57 44.4	4.740	6	8 26 1.93	1.9635	14 37 21.5	8.388
7	6 51 29.34	2.0713	19 52 57.3	4.829	7	8 27 59.07	1.9613	14 28 56.4	8.450
8	6 53 33.54	2.0688	19 48 4.9	4.918	8	8 29 56.08	1.9491	14 20 27.5	8.512
9	6 55 37.59	2.0663	19 43 7.2	5.005	9	8 31 52.96	1.9469	14 11 55.0	8.573
10	6 57 41.50	2.0638	19 38 4.3	5.093	10	8 33 49.71	1.9447	14 3 18.9	8.631
11	6 59 45.25	2.0613	19 32 56.1	5.180	11	8 35 46.33	1.9426	13 54 39.2	8.691
12	7 1 48.86	2.0588	19 27 42.7	5.267	12	8 37 42.82	1.9405	13 45 56.0	8.749
13	7 3 52.31	2.0563	19 22 24.1	5.353	13	8 39 39.19	1.9384	13 37 9.3	8.808
14	7 5 55.61	2.0538	19 17 0.4	5.438	14	8 41 35.43	1.9363	13 28 19.1	8.865
15	7 7 58.76	2.0513	19 11 31.6	5.522	15	8 43 31.55	1.9343	13 19 25.5	8.922
16	7 10 1.76	2.0487	19 5 57.7	5.606	16	8 45 27.55	1.9323	13 10 28.5	8.978
17	7 12 4.60	2.0461	19 0 18.8	5.691	17	8 47 23.43	1.9304	13 1 28.2	9.033
18	7 14 7.29	2.0436	18 54 34.8	5.774	18	8 49 19.20	1.9285	12 52 24.5	9.088
19	7 16 9.83	2.0410	18 48 45.9	5.857	19	8 51 14.85	1.9266	12 43 17.6	9.143
20	7 18 12.21	2.0384	18 42 52.0	5.939	20	8 53 10.39	1.9247	12 34 7.4	9.197
21	7 20 14.44	2.0358	18 36 53.2	6.021	21	8 55 5.82	1.9228	12 24 54.0	9.250
22	7 22 16.51	2.0332	18 30 49.5	6.103	22	8 57 1.13	1.9210	12 15 37.4	9.303
23	7 24 18.42	2.0306	N.18° 24' 41.0	6.189	23	8 58 56.34	1.9193	N.12° 6' 17.7	9.354
THURSDAY 18.					SATURDAY 20.				
0	7 26 20.18	2.0280	N.18° 18' 27.6	6.263	0	9 0 51.45	1.9176	N.11° 56' 54.9	9.406
1	7 28 21.78	2.0254	18 12 9.5	6.343	1	9 2 46.45	1.9166	11 47 29.0	9.457
2	7 30 23.23	2.0228	18 5 46.6	6.421	2	9 4 41.35	1.9142	11 38 0.1	9.507
3	7 32 24.52	2.0202	17 59 19.0	6.499	3	9 6 36.16	1.9126	11 28 28.2	9.557
4	7 34 25.65	2.0176	17 52 46.7	6.577	4	9 8 30.87	1.9111	11 18 53.3	9.606
5	7 36 26.63	2.0150	17 46 9.8	6.653	5	9 10 25.49	1.9095	11 9 15.5	9.654
6	7 38 27.45	2.0124	17 39 28.3	6.730	6	9 12 20.01	1.9080	10 59 34.8	9.703
7	7 40 28.12	2.0099	17 32 42.2	6.807	7	9 14 14.45	1.9066	10 49 51.3	9.749
8	7 42 28.64	2.0073	17 25 51.5	6.882	8	9 16 8.80	1.9052	10 40 4.9	9.796
9	7 44 29.00	2.0047	17 18 56.4	6.956	9	9 18 3.07	1.9038	10 30 15.7	9.843
10	7 46 29.20	2.0021	17 11 56.8	7.031	10	9 19 57.26	1.9024	10 20 23.8	9.888
11	7 48 29.25	1.9996	17 4 52.7	7.104	11	9 21 51.36	1.9011	10 10 29.2	9.933
12	7 50 29.15	1.9971	16 57 44.3	7.177	12	9 23 45.39	1.8998	10 0 31.9	9.978
13	7 52 28.90	1.9946	16 50 31.5	7.249	13	9 25 39.34	1.8986	9 50 32.0	10.021
14	7 54 28.49	1.9919	16 43 14.4	7.321	14	9 27 33.22	1.8975	9 40 29.4	10.064
15	7 56 27.93	1.9894	16 35 53.0	7.393	15	9 29 27.04	1.8964	9 30 24.3	10.106
16	7 58 27.22	1.9869	16 28 27.3	7.463	16	9 31 20.79	1.8953	9 20 16.6	10.149
17	8 0 26.36	1.9844	16 20 57.4	7.533	17	9 33 14.47	1.8943	9 10 6.4	10.190
18	8 2 25.35	1.9819	16 13 23.3	7.602	18	9 35 8.09	1.8932	8 59 53.8	10.230
19	8 4 24.19	1.9794	16 5 45.1	7.671	19	9 37 1.66	1.8923	8 49 38.8	10.271
20	8 6 22.88	1.9770	15 58 2.8	7.739	20	9 38 55.17	1.8914	8 39 21.3	10.311
21	8 8 21.43	1.9746	15 50 16.4	7.806	21	9 40 48.63	1.8906	8 29 1.5	10.350
22	8 10 19.83	1.9722	15 42 26.0	7.873	22	9 42 42.03	1.8897	8 18 39.3	10.389
23	8 12 18.09	1.9697	15 34 31.6	7.940	23	9 44 35.39	1.8890	8 8 14.9	10.426
24	8 14 16.20	1.9673	N.15° 26' 33.2	8.006	24	9 46 28.71	1.8883	N. 7° 57' 48.2	10.463

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 21.					TUESDAY 23.				
0	9 46 28.71	1.8883	N. 7 57 48.2	10.463	0	11 17 17.82	1.9179	S. 0 56 2.2	11.542
1	9 48 21.98	1.8875	7 47 19.3	10.500	1	11 19 12.96	1.9200	1 7 34.9	11.549
2	9 50 15.21	1.8869	7 36 48.2	10.536	2	11 21 8.22	1.9222	1 19 8.1	11.556
3	9 52 8.41	1.8864	7 26 15.0	10.573	3	11 23 3.62	1.9244	1 30 41.6	11.561
4	9 54 1.58	1.8860	7 15 39.6	10.607	4	11 24 59.15	1.9267	1 42 15.4	11.566
5	9 55 54.72	1.8864	7 5 2.1	10.641	5	11 26 54.82	1.9290	1 53 49.4	11.569
6	9 57 47.83	1.8850	6 54 22.7	10.674	6	11 28 50.63	1.9314	2 5 23.7	11.572
7	9 59 40.92	1.8846	6 43 41.2	10.707	7	11 30 46.59	1.9339	2 16 58.1	11.576
8	10 1 33.98	1.8843	6 32 57.8	10.740	8	11 32 42.70	1.9364	2 28 32.7	11.577
9	10 3 27.03	1.8840	6 22 12.4	10.772	9	11 34 38.96	1.9390	2 40 7.3	11.577
10	10 5 20.06	1.8838	6 11 25.1	10.803	10	11 36 35.38	1.9417	2 51 42.0	11.578
11	10 7 13.08	1.8837	6 0 36.0	10.834	11	11 38 31.97	1.9445	3 3 16.7	11.577
12	10 9 6.10	1.8836	5 49 45.0	10.866	12	11 40 28.72	1.9473	3 14 51.3	11.576
13	10 10 59.11	1.8835	5 38 52.2	10.894	13	11 42 25.64	1.9502	3 26 25.8	11.574
14	10 12 52.12	1.8835	5 27 57.7	10.923	14	11 44 22.74	1.9531	3 38 0.2	11.572
15	10 14 45.13	1.8836	5 17 1.4	10.952	15	11 46 20.01	1.9560	3 49 34.4	11.568
16	10 16 38.15	1.8837	5 6 3.5	10.979	16	11 48 17.46	1.9591	4 1 8.4	11.564
17	10 18 31.18	1.8838	4 55 3.9	11.007	17	11 50 15.10	1.9623	4 12 42.1	11.560
18	10 20 24.21	1.8840	4 44 2.7	11.033	18	11 52 12.93	1.9656	4 24 15.5	11.553
19	10 22 17.26	1.8843	4 32 59.9	11.060	19	11 54 10.96	1.9688	4 35 48.4	11.546
20	10 24 10.33	1.8847	4 21 55.5	11.087	20	11 56 9.19	1.9722	4 47 20.9	11.537
21	10 26 3.42	1.8851	4 10 49.6	11.110	21	11 58 7.62	1.9756	4 58 52.9	11.529
22	10 27 56.54	1.8855	3 59 42.3	11.133	22	12 0 6.25	1.9789	5 10 24.4	11.521
23	10 29 49.68	1.8860	N. 3 48 33.6	11.157	23	12 2 5.09	1.9825	S. 5 21 55.4	11.511
MONDAY 22.					WEDNESDAY 24.				
0	10 31 42.85	1.8865	N. 3 37 23.4	11.181	0	12 4 4.15	1.9862	S. 5 33 25.7	11.500
1	10 33 36.06	1.8871	3 26 11.9	11.203	1	12 6 3.43	1.9896	5 44 55.4	11.488
2	10 35 29.31	1.8878	3 14 59.0	11.225	2	12 8 2.93	1.9930	5 56 24.3	11.476
3	10 37 22.60	1.8885	3 3 44.9	11.246	3	12 10 2.65	1.9973	6 7 52.4	11.463
4	10 39 15.93	1.8893	2 52 29.5	11.267	4	12 12 2.60	2.0012	6 19 19.7	11.446
5	10 41 9.31	1.8902	2 41 12.9	11.287	5	12 14 2.79	2.0053	6 30 46.1	11.433
6	10 43 2.75	1.8912	2 29 55.1	11.306	6	12 16 3.22	2.0091	6 42 11.6	11.417
7	10 44 56.25	1.8921	2 18 36.2	11.324	7	12 18 3.89	2.0132	6 53 36.1	11.399
8	10 46 49.80	1.8931	2 7 16.2	11.342	8	12 20 4.80	2.0173	7 4 59.5	11.381
9	10 48 43.42	1.8942	1 55 55.1	11.360	9	12 22 5.96	2.0215	7 16 21.8	11.362
10	10 50 37.10	1.8953	1 44 33.0	11.377	10	12 24 7.38	2.0258	7 27 42.9	11.342
11	10 52 30.86	1.8965	1 33 9.9	11.393	11	12 26 9.06	2.0302	7 39 2.8	11.322
12	10 54 24.69	1.8978	1 21 45.9	11.407	12	12 28 11.00	2.0346	7 50 21.5	11.300
13	10 56 18.60	1.8992	1 10 21.0	11.423	13	12 30 13.20	2.0390	8 1 38.8	11.277
14	10 58 12.59	1.9005	0 58 55.2	11.437	14	12 32 15.68	2.0435	8 12 54.7	11.253
15	11 0 6.66	1.9020	0 47 28.5	11.451	15	12 34 18.43	2.0481	8 24 9.2	11.229
16	11 2 0.83	1.9036	0 36 1.1	11.463	16	12 36 21.45	2.0527	8 35 22.2	11.203
17	11 3 55.09	1.9051	0 24 32.9	11.476	17	12 38 24.76	2.0575	8 46 33.6	11.177
18	11 5 49.44	1.9067	0 13 4.0	11.487	18	12 40 28.35	2.0623	8 57 43.4	11.149
19	11 7 43.90	1.9085	N. 0 1 34.4	11.498	19	12 42 32.23	2.0671	9 8 51.5	11.120
20	11 9 38.46	1.9103	S. 0 9 55.8	11.509	20	12 44 36.40	2.0720	9 19 57.8	11.090
21	11 11 33.13	1.9121	0 21 26.6	11.518	21	12 46 40.87	2.0770	9 31 2.3	11.059
22	11 13 27.91	1.9140	0 32 58.0	11.527	22	12 48 45.64	2.0820	9 42 4.9	11.027
23	11 15 22.81	1.9159	0 44 29.9	11.535	23	12 50 50.71	2.0871	9 53 5.6	10.995
24	11 17 17.82	1.9179	S. 0 56 2.2	11.542	24	12 52 56.09	2.0923	S. 10 4 4.3	10.961

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 25.					SATURDAY 27.				
0	12 ^h 52 ^m 56.09	2.0923	S. 10° 4' 4.3"	10.961	0	14 ^h 40 ^m 16.84	2.3946	S. 17° 48' 5.5"	7.592
1	12 55 1.78	2.0976	10 15 0.9	10.926	1	14 42 40.72	2.4016	17 55 54.3	7.763
2	12 57 7.79	2.1028	10 25 55.4	10.890	2	14 45 5.02	2.4084	18 3 37.1	7.933
3	12 59 14.11	2.1081	10 36 47.7	10.853	3	14 47 29.73	2.4152	18 11 13.8	7.961
4	13 1 20.76	2.1136	10 47 37.7	10.814	4	14 49 54.85	2.4221	18 18 44.4	7.986
5	13 3 27.74	2.1190	10 58 25.4	10.776	5	14 52 20.38	2.4290	18 26 8.8	7.953
6	13 5 35.04	2.1246	11 9 10.7	10.734	6	14 54 46.32	2.4357	18 33 26.8	7.947
7	13 7 42.68	2.1301	11 19 53.5	10.692	7	14 57 12.67	2.4425	18 40 38.4	7.139
8	13 9 50.65	2.1357	11 30 33.7	10.648	8	14 59 39.43	2.4493	18 47 43.5	7.090
9	13 11 58.96	2.1413	11 41 11.3	10.605	9	15 2 6.59	2.4560	18 54 42.0	6.919
10	13 14 7.61	2.1471	11 51 46.3	10.560	10	15 4 34.15	2.4627	19 1 33.8	6.907
11	13 16 16.61	2.1529	12 2 18.5	10.513	11	15 7 2.12	2.4695	19 8 18.8	6.698
12	13 18 25.96	2.1588	12 12 47.9	10.468	12	15 9 30.49	2.4762	19 14 57.0	6.578
13	13 20 35.66	2.1647	12 23 14.4	10.417	13	15 11 59.26	2.4828	19 21 28.2	6.462
14	13 22 45.72	2.1706	12 33 37.9	10.367	14	15 14 28.42	2.4893	19 27 52.4	6.344
15	13 24 56.13	2.1766	12 43 58.4	10.315	15	15 16 57.97	2.4958	19 34 9.5	6.224
16	13 27 6.91	2.1827	12 54 15.7	10.263	16	15 19 27.92	2.5023	19 40 19.3	6.108
17	13 29 18.05	2.1889	13 4 29.8	10.208	17	15 21 58.25	2.5087	19 46 21.8	6.990
18	13 31 29.56	2.1949	13 14 40.7	10.153	18	15 24 28.97	2.5151	19 52 16.9	6.866
19	13 33 41.44	2.2011	13 24 48.2	10.097	19	15 27 0.07	2.5215	19 58 4.6	6.731
20	13 35 53.69	2.2073	13 34 52.3	10.039	20	15 29 31.55	2.5278	20 3 44.7	6.604
21	13 38 6.32	2.2136	13 44 52.9	9.980	21	15 32 3.40	2.5340	20 9 17.1	6.476
22	13 40 19.32	2.2199	13 54 49.9	9.920	22	15 34 35.63	2.5401	20 14 41.8	6.347
23	13 42 32.71	2.2263	S. 14° 4' 43.3"	9.865	23	15 37 8.22	2.5462	S. 20° 19' 58.7"	6.317
FRIDAY 26.					SUNDAY 28.				
0	13 44 46.48	2.2327	S. 14° 14' 32.9"	9.795	0	15 39 41.17	2.5523	S. 20° 25' 7.8"	6.085
1	13 47 0.64	2.2393	14 24 18.7	9.731	1	15 42 14.48	2.5582	20 30 8.9	4.961
2	13 49 15.18	2.2456	14 34 0.6	9.665	2	15 44 48.15	2.5641	20 35 1.9	4.816
3	13 51 30.11	2.2522	14 43 38.5	9.598	3	15 47 22.17	2.5698	20 39 46.7	4.679
4	13 53 45.44	2.2588	14 53 12.4	9.530	4	15 49 56.53	2.5755	20 44 23.4	4.543
5	13 56 1.16	2.2653	15 2 42.1	9.460	5	15 52 31.23	2.5813	20 48 51.8	4.408
6	13 58 17.28	2.2720	15 12 7.6	9.389	6	15 55 6.27	2.5868	20 53 11.8	4.263
7	14 0 33.80	2.2787	15 21 28.8	9.317	7	15 57 41.64	2.5923	20 57 23.3	4.121
8	14 2 50.72	2.2853	15 30 45.6	9.243	8	16 0 17.34	2.5976	21 1 26.4	3.980
9	14 5 8.04	2.2920	15 39 57.9	9.167	9	16 2 53.35	2.6028	21 5 20.9	3.836
10	14 7 25.76	2.2987	15 49 5.6	9.090	10	16 5 29.68	2.6080	21 9 6.7	3.691
11	14 9 43.89	2.3055	15 58 8.7	9.012	11	16 8 6.31	2.6131	21 12 43.8	3.546
12	14 12 2.42	2.3122	16 7 7.0	8.933	12	16 10 43.25	2.6181	21 16 12.1	3.398
13	14 14 21.36	2.3191	16 16 0.5	8.861	13	16 13 20.48	2.6239	21 19 31.5	3.249
14	14 16 40.71	2.3260	16 24 49.1	8.788	14	16 15 58.00	2.6277	21 22 42.0	3.100
15	14 19 0.47	2.3327	16 33 32.7	8.694	15	16 18 35.81	2.6324	21 25 43.5	2.940
16	14 21 20.64	2.3396	16 42 11.2	8.608	16	16 21 13.89	2.6389	21 28 36.0	2.796
17	14 23 41.22	2.3464	16 50 44.5	8.512	17	16 23 52.24	2.6413	21 31 19.3	2.646
18	14 26 2.21	2.3533	16 59 12.6	8.428	18	16 26 30.85	2.6455	21 33 53.5	2.498
19	14 28 23.62	2.3602	17 7 35.3	8.333	19	16 29 9.72	2.6498	21 36 18.5	2.339
20	14 30 45.44	2.3671	17 15 52.6	8.242	20	16 31 48.83	2.6538	21 38 34.2	2.183
21	14 33 7.67	2.3739	17 24 4.3	8.149	21	16 34 28.17	2.6577	21 40 40.5	2.027
22	14 35 30.31	2.3808	17 32 10.5	8.055	22	16 37 7.75	2.6616	21 42 37.5	1.871
23	14 37 53.37	2.3877	17 40 10.9	7.950	23	16 39 47.56	2.6654	21 44 25.0	1.713
24	14 40 16.84	2.3946	S. 17° 48' 5.5"	7.893	24	16 42 27.60	2.6690	S. 21° 46' 3.0"	1.554

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 29.					TUESDAY 30.				
0	^h 16 ^m 42 ^s 27.60	2.6900	S. 21° 46' 3.0	1.584	0	^h 17 ^m 47 ^s 11.42	2.7112	S. 21° 36' 23.8	2.387
1	16 45 7.84	2.6733	21 47 31.5	1.395	1	17 49 54.09	2.7110	21 33 55.6	2.552
2	16 47 48.28	2.6766	21 48 50.4	1.285	2	17 52 36.74	2.7107	21 31 17.5	2.718
3	16 50 28.91	2.6787	21 49 59.7	1.075	3	17 55 19.37	2.7103	21 28 29.5	2.882
4	16 53 9.72	2.6817	21 50 59.4	0.913	4	17 58 1.97	2.7097	21 25 31.6	3.047
5	16 55 50.71	2.6846	21 51 49.3	0.751	5	18 0 44.53	2.7089	21 22 23.8	3.212
6	16 58 31.87	2.6873	21 52 29.5	0.689	6	18 3 27.04	2.7081	21 19 6.2	3.376
7	17 1 13.19	2.6900	21 53 0.0	0.437	7	18 6 9.50	2.7073	21 15 38.7	3.539
8	17 3 54.66	2.6923	21 53 20.7	0.283	8	18 8 51.90	2.7060	21 12 1.5	3.702
9	17 6 36.27	2.6946	21 53 31.6	0.099	9	18 11 34.22	2.7047	21 8 14.5	3.865
10	17 9 18.01	2.6968	21 53 32.6	0.065	10	18 14 16.46	2.7032	21 4 17.7	4.027
11	17 11 59.88	2.6986	21 53 23.8	0.280	11	18 16 58.60	2.7016	21 0 11.3	4.188
12	17 14 41.87	2.7007	21 53 5.0	0.396	12	18 19 40.65	2.6999	20 55 55.2	4.348
13	17 17 23.96	2.7023	21 52 36.3	0.561	13	18 22 22.59	2.6980	20 51 29.5	4.508
14	17 20 6.15	2.7039	21 51 57.7	0.797	14	18 25 4.41	2.6960	20 46 54.2	4.668
15	17 22 48.43	2.7053	21 51 9.1	0.993	15	18 27 46.11	2.6938	20 42 9.3	4.827
16	17 25 30.79	2.7066	21 50 10.6	1.058	16	18 30 27.67	2.6916	20 37 15.0	4.984
17	17 28 13.22	2.7077	21 49 2.1	1.224	17	18 33 9.09	2.6891	20 32 11.2	5.141
18	17 30 55.71	2.7086	21 47 43.7	1.390	18	18 35 50.37	2.6866	20 26 58.1	5.297
19	17 33 38.25	2.7093	21 46 15.3	1.557	19	18 38 31.49	2.6839	20 21 35.7	5.451
20	17 36 20.83	2.7100	21 44 36.9	1.722	20	18 41 12.44	2.6811	20 16 4.0	5.606
21	17 39 3.45	2.7106	21 42 48.6	1.888	21	18 43 53.22	2.6782	20 10 23.1	5.768
22	17 41 46.09	2.7108	21 40 50.3	2.055	22	18 46 33.83	2.6762	20 4 33.0	5.910
23	17 44 28.75	2.7111	21 38 42.0	2.221	23	18 49 14.25	2.6731	19 58 33.9	6.060
24	17 47 11.42	2.7113	S. 21° 36' 23.8	2.387	24	18 51 54.48	2.6698	S. 19° 52' 25.8	6.210

PHASES OF THE MOON.

○ Full Moon,	^d 1 ^h 11 ^m 29.8
☾ Last Quarter,	8 1 52.5
● New Moon,	15 19 36.1
☾ First Quarter,	23 22 31.2
○ Full Moon,	30 18 46.0

☾ Perigee,	^d 2 ^h 19.3
☾ Apogee,	18 1.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	Regulus W.	95° 52' 37"	2109	97° 43' 23"	2100	99° 34' 22"	2092	101° 25' 33"	2085
	Saturn W.	65 6 29	2130	66 56 42	2120	68 47 10	2111	70 37 52	2103
	Jupiter W.	46 7 42	2112	47 58 23	2101	49 49 20	2092	51 40 32	2083
	Spica W.	41 53 27	2091	43 44 40	2082	45 36 7	2073	47 27 47	2066
	α Aquilæ E.	61 1 6	2077	59 23 55	2069	57 47 3	2060	56 10 35	2050
	Fomalhaut E.	88 9 14	2058	86 29 32	2050	84 49 41	2044	83 9 43	2031
	α Pegasi E.	106 50 15	2036	105 2 40	2028	103 14 47	2018	101 26 39	2004
2	Saturn W.	79 54 7	2073	81 45 47	2070	83 37 32	2063	85 29 22	2055
	Jupiter W.	60 59 34	2060	62 51 50	2046	64 44 12	2043	66 36 39	2041
	Spica W.	56 48 40	2030	58 41 14	2026	60 33 53	2023	62 26 37	2020
	α Aquilæ E.	48 17 5	2004	46 44 51	2006	45 13 43	2017	43 43 51	2006
	Fomalhaut E.	74 49 23	2058	73 9 30	2055	71 29 47	2074	69 50 17	2066
	α Pegasi E.	92 23 0	2173	90 33 51	2169	88 44 37	2167	86 55 20	2166
3	Saturn W.	94 48 54	2067	96 40 44	2070	98 32 30	2073	100 24 11	2077
	Jupiter W.	75 59 26	2041	77 51 57	2042	79 44 25	2045	81 36 49	2046
	Spica W.	71 50 39	2032	73 43 24	2033	75 36 6	2037	77 28 43	2041
	Antares W.	26 42 2	2066	28 33 8	2091	30 24 21	2087	32 15 40	2086
	Fomalhaut E.	61 37 48	2061	60 0 42	2708	58 24 13	2739	56 48 25	2774
	α Pegasi E.	77 48 49	2174	75 59 42	2178	74 10 42	2184	72 21 50	2190
4	Jupiter W.	90 57 6	2077	92 48 41	2084	94 40 5	2092	96 31 17	2101
	Spica W.	86 50 5	2068	88 41 54	2075	90 33 32	2083	92 24 58	2091
	Antares W.	41 32 8	2097	43 23 12	2102	45 14 8	2108	47 4 55	2116
	Fomalhaut E.	49 2 33	2017	47 32 41	2092	46 4 9	2155	44 37 6	2236
	α Pegasi E.	63 20 34	2241	61 33 7	2255	59 46 1	2270	57 59 17	2285
	α Arietis E.	106 10 30	2103	104 19 35	2109	102 28 50	2116	100 38 16	2124
5	Spica W.	101 38 39	2140	103 28 37	2161	105 18 18	2168	107 7 42	2174
	Antares W.	56 15 54	2159	58 5 24	2169	59 54 39	2179	61 43 38	2190
	α Pegasi E.	49 12 11	2239	47 28 21	2415	45 45 8	2444	44 2 36	2475
	α Arietis E.	91 28 45	2173	89 39 36	2184	87 50 44	2196	86 2 9	2207
	SUN E.	130 39 40	2430	128 56 48	2443	127 14 13	2454	125 31 55	2467
6	Antares W.	70 44 10	2261	72 31 21	2265	74 18 12	2279	76 4 43	2291
	α Pegasi E.	35 42 15	2064	34 5 13	2741	32 29 27	2805	30 55 5	2878
	α Arietis E.	77 3 54	2273	75 17 14	2287	73 30 55	2300	71 44 56	2316
	SUN E.	117 5 2	2635	115 24 37	2649	113 44 32	2664	112 4 47	2678
7	Antares W.	84 52 18	2292	86 36 48	2376	88 20 57	2391	90 4 45	2405
	α Aquilæ W.	38 55 34	2612	40 13 55	2638	41 33 37	2673	42 54 31	2718
	α Arietis E.	63 0 30	2391	61 16 43	2408	59 33 19	2434	57 50 18	2440
	SUN E.	103 51 10	2655	102 13 29	2670	100 36 9	2686	98 59 10	2701
8	Antares W.	98 38 37	2477	100 20 22	2491	102 1 48	2505	103 42 53	2520
	α Aquilæ W.	49 52 7	2326	51 17 31	2315	52 43 21	2319	54 9 33	2323
	α Arietis E.	49 21 4	2624	47 40 24	2643	46 0 9	2660	44 20 19	2678
	SUN E.	90 59 22	2778	89 24 25	2794	87 49 49	2806	86 15 32	2824
9	α Aquilæ W.	61 24 16	2138	62 51 39	2135	64 19 6	2133	65 46 36	2133
	Fomalhaut W.	37 36 35	4152	38 45 47	4054	39 56 33	3966	41 8 44	3892
	α Arietis E.	36 7 37	2678	34 30 27	2700	32 53 47	2723	31 17 38	2748
	SUN E.	78 28 58	2696	76 56 36	2612	75 24 32	2626	73 52 45	2636

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Regulus W.	103° 16' 55"	2079	105° 8' 27"	2073	107° 0' 8"	2068	108° 51' 56"	2064
	Saturn W.	72 28 46	2096	74 19 52	2089	76 11 8	2083	78 2 33	2077
	Jupiter W.	53 31 58	2076	55 23 36	2067	57 15 26	2061	59 7 26	2055
	Spica W.	49 19 38	2059	51 11 40	2053	53 3 52	2048	54 56 12	2042
	α Aquilæ E.	54 34 35	2756	52 59 9	2785	51 24 21	2818	49 50 17	2859
	Fomalhaut E.	81 29 40	2648	79 49 34	2648	78 9 28	2649	76 29 23	2658
	α Pegasi E.	99 38 17	2196	97 49 43	2186	96 0 58	2182	94 12 3	2176
2	Saturn W.	87 21 15	2064	89 13 10	2063	91 5 6	2064	92 57 1	2066
	Jupiter W.	68 29 10	2039	70 21 43	2039	72 14 17	2038	74 6 52	2039
	Spica W.	64 19 24	2029	66 12 13	2029	68 5 2	2029	69 57 51	2030
	α Aquilæ E.	42 15 23	3164	40 48 31	3265	39 23 27	3368	38 0 23	3479
	Fomalhaut E.	68 11 3	2600	66 32 8	2616	64 53 35	2636	63 15 27	2656
	α Pegasi E.	85 6 0	2166	83 16 39	2165	81 27 19	2167	79 38 2	2170
3	Saturn W.	102 15 46	2082	104 7 13	2087	105 58 32	2094	107 49 41	2101
	Jupiter W.	83 29 8	2053	85 21 20	2058	87 13 24	2063	89 5 20	2070
	Spica W.	79 21 14	2044	81 13 39	2050	83 5 56	2055	84 58 5	2061
	Antares W.	34 7 1	2086	35 58 22	2087	37 49 41	2089	39 40 57	2092
	Fomalhaut E.	55 13 23	2612	53 39 11	2655	52 5 55	2693	50 33 40	2687
	α Pegasi E.	70 33 8	2198	68 44 38	2207	66 56 21	2217	65 8 19	2229
4	Jupiter W.	98 22 16	2109	100 13 1	2119	102 3 31	2130	103 53 45	2140
	Spica W.	94 16 11	2100	96 7 10	2109	97 57 55	2119	99 48 25	2130
	Antares W.	48 55 31	2122	50 45 56	2130	52 36 9	2139	54 26 8	2148
	Fomalhaut E.	43 11 42	2330	41 48 5	2433	40 26 26	2548	39 6 55	2677
	α Pegasi E.	56 12 56	2303	54 27 1	2322	52 41 34	2342	50 56 36	2365
	α Arietis E.	98 47 54	2133	96 57 45	2142	95 7 50	2152	93 18 10	2162
5	Spica W.	108 56 48	2187	110 45 35	2199	112 34 4	2212	114 22 14	2226
	Antares W.	63 32 20	2202	65 20 44	2214	67 8 51	2226	68 56 40	2239
	α Pegasi E.	42 20 48	2609	40 39 47	2646	38 59 38	2687	37 20 25	2633
	α Arietis E.	84 13 52	2220	82 25 54	2233	80 38 14	2245	78 50 54	2256
	SUN E.	123 49 55	2480	122 8 13	2493	120 26 50	2507	118 45 46	2521
6	Antares W.	77 50 55	2306	79 36 46	2320	81 22 17	2333	83 7 28	2346
	α Pegasi E.	29 22 18	2692	27 51 18	2690	26 22 19	2714	24 55 39	2711
	α Arietis E.	69 59 19	2331	68 14 4	2346	66 29 11	2360	64 44 39	2376
	SUN E.	110 25 22	2503	108 46 18	2509	107 7 35	2524	105 29 12	2538
7	Antares W.	91 48 12	2419	93 31 19	2434	95 14 5	2448	96 56 31	2462
	α Aquilæ W.	44 16 27	3371	45 39 17	3330	47 2 54	3294	48 27 13	3264
	α Arietis E.	56 7 40	2456	54 25 25	2473	52 43 34	2490	51 2 7	2507
	SUN E.	97 22 31	2716	95 46 13	2732	94 10 16	2747	92 34 39	2763
8	Antares W.	105 23 38	2534	107 4 4	2548	108 44 10	2562	110 23 57	2576
	α Aquilæ W.	55 36 4	3169	57 2 50	3168	58 29 49	3149	59 56 59	3142
	α Arietis E.	42 40 54	2696	41 1 54	2616	39 23 21	2636	37 45 15	2657
	SUN E.	84 41 35	2838	83 7 57	2853	81 34 38	2869	80 1 39	2883
9	α Aquilæ W.	67 14 6	3133	68 41 36	3134	70 9 4	3136	71 36 30	3139
	Fomalhaut W.	42 22 12	2825	43 36 47	2768	44 52 24	2716	46 8 54	2671
	α Arietis E.	29 42 3	2776	28 7 3	2806	26 32 43	2838	24 59 5	2876
	SUN E.	72 21 16	2954	70 50 5	2966	69 19 10	2980	67 48 32	2993

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
10	<i>α</i> Aquilæ W.	73° 3' 52"	3143	74° 31' 10"	3148	75° 58' 22"	3153	77° 25' 28"	3158
	Fomalhaut W.	47 26 12	3633	48 44 12	3607	50 2 50	3665	51 22 2	3639
	<i>α</i> Pegasi W.	25 38 41	3480	26 59 27	3407	28 21 36	3346	29 44 54	3297
	SUN E.	66 18 11	3006	64 48 6	3019	63 18 17	3031	61 48 43	3043
11	<i>α</i> Aquilæ W.	84 39 3	3194	86 5 19	3203	87 31 25	3211	88 57 21	3221
	Fomalhaut W.	58 4 21	3446	59 25 45	3434	60 47 23	3423	62 9 13	3416
	<i>α</i> Pegasi W.	36 52 57	3161	38 20 5	3134	39 47 33	3121	41 15 17	3110
	SUN E.	54 24 37	3103	52 56 31	3114	51 28 38	3124	50 0 58	3136
12	<i>α</i> Aquilæ W.	96 4 1	3274	97 28 43	3286	98 53 12	3298	100 17 26	3311
	Fomalhaut W.	69 0 19	3300	70 22 47	3288	71 45 17	3287	73 7 48	3286
	<i>α</i> Pegasi W.	48 36 32	3061	50 5 5	3079	51 33 40	3078	53 2 16	3078
	SUN E.	42 45 47	3186	41 19 21	3196	39 53 6	3206	38 27 3	3214
13	Fomalhaut W.	80 0 17	3394	81 22 40	3396	82 44 59	3401	84 7 14	3406
	<i>α</i> Pegasi W.	60 25 15	3082	61 53 46	3086	63 22 14	3067	64 50 40	3060
	SUN E.	31 19 27	3266	29 54 27	3267	28 29 37	3276	27 4 57	3283
18	SUN W.	24 2 40	3461	25 23 59	3460	26 45 19	3460	28 6 39	3460
	Regulus E.	37 38 54	3136	36 11 28	3140	34 44 7	3146	33 16 52	3163
	Saturn E.	68 44 15	3127	67 16 38	3129	65 49 3	3131	64 21 31	3133
	Jupiter E.	87 4 42	3100	85 36 32	3101	84 8 23	3101	82 40 15	3101
	Spica E.	91 19 33	3078	89 50 57	3079	88 22 22	3079	86 53 47	3079
19	SUN W.	34 53 28	3446	36 14 54	3444	37 36 21	3441	38 57 51	3439
	Regulus E.	26 2 44	3193	24 36 26	3206	23 10 23	3221	21 44 39	3241
	Saturn E.	57 4 13	3137	55 36 48	3136	54 9 24	3136	52 42 1	3136
	Jupiter E.	75 19 36	3101	73 51 27	3101	72 23 18	3099	70 55 7	3097
	Spica E.	79 30 51	3077	78 2 13	3076	76 33 34	3074	75 4 53	3073
20	SUN W.	45 46 5	3423	47 7 56	3419	48 29 51	3414	49 51 52	3409
	Saturn E.	45 25 7	3138	43 57 44	3139	42 30 22	3139	41 3 0	3140
	Jupiter E.	63 33 39	3087	62 5 13	3083	60 36 43	3080	59 8 9	3076
	Spica E.	67 40 47	3058	66 11 46	3055	64 42 41	3051	63 13 31	3047
	Antares E.	113 6 15	3073	111 37 33	3069	110 8 45	3065	108 39 52	3060
21	SUN W.	56 43 29	3379	58 6 10	3373	59 28 59	3364	60 51 57	3356
	Mars W.	23 25 36	3377	24 48 19	3366	26 11 27	3357	27 34 56	3330
	Saturn E.	33 46 24	3147	32 19 11	3160	30 52 2	3168	29 25 0	3163
	Jupiter E.	51 44 5	3056	50 15 0	3049	48 45 48	3043	47 16 29	3038
	Spica E.	55 46 10	3018	54 16 20	3012	52 46 22	3005	51 16 16	2998
	Antares E.	101 13 49	3030	99 44 14	3024	98 14 31	3017	96 44 39	3006
22	SUN W.	67 49 18	3308	69 13 20	3298	70 37 34	3286	72 2 2	3276
	Mars W.	34 37 1	3243	36 2 19	3229	37 27 54	3214	38 53 47	3200
	Venus W.	25 22 50	3226	26 42 47	3499	28 3 12	3476	29 24 4	3463
	Jupiter E.	39 48 4	3007	38 18 0	3001	36 47 48	2994	35 17 28	2986
	Spica E.	43 43 18	2966	42 12 10	2946	40 40 49	2936	39 9 16	2926
	Antares E.	89 12 50	2968	87 41 55	2956	86 10 47	2946	84 39 27	2936
23	SUN W.	79 7 50	3212	80 33 45	3198	81 59 57	3183	83 26 26	3168
	Mars W.	46 7 28	3126	47 35 6	3110	49 3 3	3096	50 31 19	3079
	Venus W.	36 14 33	3349	37 37 48	3330	39 1 25	3310	40 25 25	3290
	Regulus W.	23 16 1	2963	24 46 23	2965	26 17 19	2940	27 48 47	2916

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
10	α Aquilæ W.	78° 52' 27"	3164	80° 19' 19"	3173	81° 46' 2"	3178	83° 12' 37"	3186
	Fomalhaut W.	52 41 43	3215	54 1 50	3244	55 22 21	3276	56 43 12	3260
	α Pegasi W.	31 9 9	3256	32 34 12	3223	33 59 55	3193	35 26 12	3170
	SUN E.	60 19 24	3066	58 50 20	3068	57 21 31	3060	55 52 57	3091
11	α Aquilæ W.	90 23 5	3231	91 48 37	3241	93 13 58	3252	94 39 6	3263
	Fomalhaut W.	63 31 12	3406	64 53 20	3402	66 15 34	3397	67 37 54	3368
	α Pegasi W.	42 43 15	3101	44 11 23	3094	45 39 40	3098	47 8 3	3084
	SUN E.	48 33 31	3145	47 6 17	3156	45 39 15	3166	44 12 25	3176
12	α Aquilæ W.	101 41 25	3224	103 5 9	3236	104 28 37	3251	105 51 49	3267
	Fomalhaut W.	74 30 20	3266	75 52 52	3288	77 15 22	3290	78 37 51	3292
	α Pegasi W.	54 30 53	3078	55 59 30	3078	57 28 7	3079	58 56 42	3081
	SUN E.	37 1 11	3223	35 35 29	3233	34 9 58	3241	32 44 37	3250
13	Fomalhaut W.	85 29 24	3411	86 51 28	3415	88 13 27	3421	89 35 20	3427
	α Pegasi W.	66 19 2	3093	67 47 20	3096	69 15 35	3100	70 43 45	3103
	SUN E.	25 40 26	3292	24 16 5	3300	22 51 54	3306	21 27 52	3317
18	SUN W.	29 27 59	3449	30 49 20	3449	32 10 41	3447	33 32 4	3446
	Regulus E.	31 49 45	3186	30 22 46	3166	28 55 55	3173	27 29 14	3183
	Saturn E.	62 54 1	3133	61 26 32	3134	59 59 4	3136	58 31 38	3137
	Jupiter E.	81 12 7	3101	79 43 59	3102	78 15 52	3101	76 47 44	3101
	Spica E.	85 25 12	3079	83 56 37	3079	82 28 2	3079	80 59 27	3078
19	SUN W.	40 19 23	3437	41 40 58	3433	43 2 37	3431	44 24 19	3427
	Regulus E.	20 19 18	3265	18 54 26	3295	17 30 9	3234	16 6 37	3265
	Saturn E.	51 14 38	3138	49 47 15	3138	48 19 52	3139	46 52 30	3138
	Jupiter E.	69 26 54	3096	67 58 39	3094	66 30 22	3091	65 2 2	3089
	Spica E.	73 36 10	3070	72 7 24	3068	70 38 35	3065	69 9 43	3062
20	SUN W.	51 13 58	3403	52 36 11	3398	53 58 30	3392	55 20 56	3386
	Saturn E.	39 35 39	3140	38 8 18	3141	36 40 58	3143	35 13 40	3144
	Jupiter E.	57 39 30	3073	56 10 47	3068	54 41 58	3064	53 13 4	3060
	Spica E.	61 44 16	3042	60 14 55	3036	58 45 27	3030	57 15 52	3025
	Antares E.	107 10 52	3054	105 41 46	3049	104 12 34	3043	102 43 15	3038
21	SUN W.	62 15 5	3347	63 38 22	3338	65 1 50	3329	66 25 28	3319
	Mars W.	28 58 44	3204	30 22 51	3288	31 47 17	3272	33 12 1	3259
	Saturn E.	27 58 5	3170	26 31 20	3180	25 4 47	3194	23 38 31	3213
	Jupiter E.	45 47 3	3092	44 17 30	3026	42 47 49	3019	41 18 0	3014
	Spica E.	49 46 1	3090	48 15 36	2982	46 45 1	2973	45 14 15	2965
	Antares E.	95 14 38	3001	93 44 27	2993	92 14 6	2985	90 43 34	2975
22	SUN W.	73 26 43	3263	74 51 38	3251	76 16 47	3236	77 42 11	3225
	Mars W.	40 19 56	3186	41 46 22	3171	43 13 6	3166	44 40 8	3141
	Venus W.	30 45 22	3431	32 7 4	3409	33 29 10	3388	34 51 40	3368
	Jupiter E.	33 47 0	2981	32 16 24	2976	30 45 41	2971	29 14 51	2966
	Spica E.	37 37 30	2915	36 5 30	2904	34 33 16	2893	33 0 48	2881
	Antares E.	83 7 53	2925	81 36 6	2913	80 4 4	2901	78 31 47	2890
23	SUN W.	84 53 13	3153	86 20 18	3138	87 47 41	3122	89 15 24	3106
	Mars W.	51 59 54	3063	53 28 49	3047	54 58 4	3030	56 27 40	3014
	Venus W.	41 49 48	3271	43 14 33	3252	44 39 41	3232	46 5 11	3213
	Regulus W.	29 20 45	2894	30 53 12	2873	32 26 7	2850	33 59 30	2830

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	III ^h .	P. L. of Diff.	VI ^h .	P. L. of Diff.	IX ^h .	P. L. of Diff.
23	Spica E.	31° 28' 5"	2809	29° 55' 7"	2857	28° 21' 53"	2845	26° 48' 23"	2831
	Antares E.	76 59 15	2878	75 26 28	2865	73 53 24	2852	72 20 3	2838
24	SUN W.	90 43 26	3099	92 11 49	3073	93 40 32	3055	95 9 37	3038
	Mars W.	57 57 36	2996	59 27 54	2979	60 58 33	2961	62 29 35	2943
	Venus W.	47 31 5	3193	48 57 22	3173	50 24 3	3154	51 51 7	3134
	Regulus W.	35 33 19	2810	37 7 34	2789	38 42 16	2770	40 17 23	2750
	Antares E.	64 28 51	2767	62 53 40	2751	61 18 8	2736	59 42 16	2721
	α Aquilæ E.	115 30 39	3282	114 6 7	3253	112 41 1	3225	111 15 22	3198
25	SUN W.	102 40 31	2946	104 11 52	2927	105 43 36	2908	107 15 45	2888
	Mars W.	70 10 27	2851	71 43 49	2832	73 17 35	2813	74 51 46	2794
	Venus W.	59 12 34	3032	60 42 7	3011	62 12 6	2991	63 42 30	2970
	Regulus W.	48 19 29	2853	49 57 13	2833	51 35 23	2813	53 14 0	2794
	Saturn W.	18 1 10	2969	19 31 37	2917	21 3 34	2856	22 36 49	2804
	Antares E.	51 37 39	2639	49 59 37	2623	48 21 13	2607	46 42 27	2590
	α Aquilæ E.	103 59 15	3072	102 30 31	3048	101 1 18	3028	99 31 36	3002
26	SUN W.	115 2 47	2789	116 37 29	2770	118 12 36	2750	119 48 10	2730
	Mars W.	82 49 4	2695	84 25 50	2675	86 3 3	2656	87 40 42	2637
	Venus W.	71 21 8	2895	72 54 12	2843	74 27 44	2823	76 1 43	2801
	Regulus W.	61 33 46	2486	63 15 5	2477	64 56 51	2458	66 39 4	2438
	Saturn W.	30 37 55	2612	32 16 33	2592	33 55 53	2563	35 35 52	2536
	Antares E.	38 22 54	2607	36 41 51	2492	35 0 27	2477	33 18 42	2463
	α Aquilæ E.	91 56 22	2899	90 24 2	2880	88 51 18	2862	87 18 10	2845
27	Venus W.	83 58 26	2696	85 35 8	2678	87 12 17	2659	88 49 52	2639
	Regulus W.	75 17 2	2343	77 1 59	2324	78 47 24	2306	80 33 15	2288
	Saturn W.	44 4 53	2403	45 48 23	2361	47 32 25	2339	49 16 58	2328
	Jupiter W.	25 43 3	2426	27 26 1	2397	29 9 40	2371	30 53 57	2346
	Spica W.	21 13 55	2333	22 59 7	2313	24 44 47	2294	26 30 56	2274
	α Aquilæ E.	79 27 12	2769	77 52 4	2757	76 16 40	2746	74 41 1	2737
	Fomalhaut E.	106 39 17	2641	105 5 42	2613	103 31 31	2597	101 56 46	2578
28	Regulus W.	89 28 58	2303	91 17 21	2187	93 6 8	2172	94 55 18	2157
	Saturn W.	58 7 5	2243	59 54 29	2225	61 42 19	2208	63 30 35	2189
	Jupiter W.	39 43 53	2237	41 31 25	2219	43 19 24	2201	45 7 50	2184
	Spica W.	35 28 25	2186	37 17 11	2171	39 6 22	2154	40 55 59	2139
	α Aquilæ E.	66 40 12	2710	65 3 45	2710	63 27 18	2712	61 50 54	2716
	Fomalhaut E.	93 55 32	2659	92 17 57	2642	90 39 59	2626	89 1 40	2612
	α Pegasi E.	113 1 51	2344	111 16 55	2324	109 31 30	2304	107 45 37	2287
29	Saturn W.	72 37 43	2119	74 28 13	2107	76 19 1	2096	78 10 7	2085
	Jupiter W.	54 16 9	2109	56 6 55	2096	57 58 1	2084	59 49 25	2073
	Spica W.	50 9 28	2173	52 1 11	2160	53 53 12	2048	55 45 31	2036
	α Aquilæ E.	53 51 44	2786	52 16 58	2812	50 42 46	2842	49 9 13	2878
	Fomalhaut E.	80 45 46	2661	79 5 57	2656	77 26 1	2651	75 45 59	2640
	α Pegasi E.	98 50 0	2309	97 1 46	2196	95 13 13	2186	93 24 23	2174
30	Saturn W.	87 29 27	2041	89 21 57	2035	91 14 36	2030	93 7 24	2028
	Jupiter W.	69 10 25	2028	71 3 16	2021	72 56 18	2015	74 49 29	2010
	Spica W.	65 10 50	1996	67 4 31	1989	68 58 22	1984	70 52 22	1979
	Antares W.	20 10 18	2106	22 1 8	2084	23 52 32	2064	25 44 26	2049
	Fomalhaut E.	67 26 5	2670	65 46 29	2692	64 7 9	2696	62 28 8	2612
	α Pegasi E.	84 16 31	2134	82 26 23	2129	80 36 8	2124	78 45 46	2123

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	Spica	E.	25° 14' 36"	2818	23° 40' 32"	2808	22° 6' 12"	2793	20° 31' 35"	2780
	Antares	E.	70 46 25	2825	69 12 29	2811	67 38 15	2797	66 3 43	2783
24	SUN	W.	96 39 3	3020	98 8 51	3002	99 39 1	2984	101 9 34	2966
	Mars	W.	64 0 59	2925	65 32 46	2907	67 4 56	2889	68 37 29	2880
	Venus	W.	53 18 35	3114	54 46 28	3094	56 14 45	3073	57 43 27	3053
	Regulus	W.	41 52 56	2731	43 28 55	2711	45 5 20	2691	46 42 12	2672
	Antares	E.	58 6 4	2704	56 29 30	2689	54 52 35	2672	53 15 18	2656
	α Aquilæ	E.	109 49 11	3172	108 22 28	3146	106 55 14	3121	105 27 30	3096
25	SUN	W.	108 48 19	2889	110 21 18	2849	111 54 42	2829	113 28 32	2810
	Mars	W.	76 26 22	2774	78 1 24	2756	79 36 51	2736	81 12 44	2716
	Venus	W.	65 13 20	2949	66 44 37	2927	68 16 21	2907	69 48 31	2886
	Regulus	W.	54 53 3	2674	56 32 33	2654	58 12 31	2635	59 52 55	2616
	Saturn	W.	24 11 12	2758	25 46 35	2717	27 22 52	2679	29 0 0	2644
	Antares	E.	45 3 18	2678	43 23 46	2656	41 43 51	2640	40 3 34	2624
26	α Aquilæ	E.	98 1 26	2981	96 30 49	2960	94 59 46	2939	93 28 17	2919
	SUN	W.	121 24 10	2710	123 0 36	2690	124 37 29	2671	126 14 48	2652
	Mars	W.	89 18 47	2617	90 57 19	2598	92 36 17	2578	94 15 42	2559
	Venus	W.	77 36 9	2781	79 11 2	2760	80 46 23	2739	82 22 11	2719
	Regulus	W.	68 21 45	2419	70 4 53	2399	71 48 29	2380	73 32 32	2362
	Saturn	W.	37 16 29	2499	38 57 43	2476	40 39 32	2450	42 21 56	2428
27	Antares	E.	31 36 37	2449	29 54 12	2437	28 11 30	2426	26 28 32	2416
	α Aquilæ	E.	85 44 40	2828	84 10 48	2811	82 36 35	2797	81 2 3	2782
	Venus	W.	90 27 54	2620	92 6 22	2601	93 45 15	2583	95 24 39	2566
	Regulus	W.	82 19 32	2270	84 6 16	2253	85 53 25	2236	87 40 59	2219
	Saturn	W.	51 2 2	2318	52 47 35	2296	54 33 37	2279	56 20 7	2260
	Jupiter	W.	32 38 50	2323	34 24 17	2300	36 10 17	2277	37 56 50	2267
28	Spica	W.	28 17 33	2266	30 4 37	2239	31 52 7	2221	33 40 3	2204
	α Aquilæ	E.	73 5 10	2729	71 29 8	2721	69 52 56	2716	68 16 37	2711
	Fomalhaut	E.	100 21 29	2740	98 45 42	2718	97 9 26	2697	95 32 42	2678
	Regulus	W.	96 44 50	2143	98 34 44	2129	100 24 59	2116	102 15 34	2108
	Saturn	W.	65 19 15	2176	67 8 19	2161	68 57 46	2147	70 47 34	2133
	Jupiter	W.	46 56 42	2167	48 45 59	2151	50 35 40	2136	52 25 44	2122
29	Spica	W.	42 45 58	2126	44 36 19	2111	46 27 2	2098	48 18 5	2086
	α Aquilæ	E.	60 14 36	2724	58 38 28	2735	57 2 34	2748	55 26 58	2765
	Fomalhaut	E.	87 23 1	2669	85 44 4	2667	84 4 51	2677	82 25 25	2668
	α Pegasi	E.	105 59 18	2269	104 12 33	2263	102 25 24	2258	100 37 53	2253
	Saturn	W.	80 1 30	2074	81 53 9	2066	83 45 2	2067	85 37 8	2048
	Jupiter	W.	61 41 7	2082	63 33 5	2062	65 25 18	2048	67 17 45	2036
30	Spica	W.	57 38 6	2028	59 30 57	2019	61 24 2	2016	63 17 20	2008
	α Aquilæ	E.	47 36 26	2921	46 4 34	2972	44 33 46	3030	43 4 11	3096
	Fomalhaut	E.	74 5 55	2650	72 25 51	2661	70 45 49	2666	69 5 53	2661
	α Pegasi	E.	91 35 16	2164	89 45 54	2166	87 56 18	2147	86 6 30	2139
	Saturn	W.	95 0 19	2021	96 53 20	2019	98 46 25	2017	100 39 33	2016
	Jupiter	W.	76 42 48	2006	78 36 13	2003	80 29 43	2000	82 23 17	1999
	Spica	W.	72 46 29	1975	74 40 42	1972	76 35 0	1970	78 29 22	1968
	Antares	W.	27 36 44	2037	29 29 21	2026	31 22 14	2018	33 15 20	2012
	Fomalhaut	E.	60 49 30	2682	59 11 19	2687	57 33 41	2684	55 56 39	2715
	α Pegasi	E.	76 55 20	2120	75 4 52	2120	73 14 23	2120	71 23 55	2122

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
		^h ^m ^s	^s	N. 23° 8' 36".2	["]	['] ["]	^s	^m ^s	^s
Wed.	1	6 39 36.35	10.338	N.23° 8' 36".2	9.78	15 46.16	68.80	3 25.03	0.482
Thur.	2	6 43 44.39	10.327	23 4 29.3	10.79	15 46.16	68.76	3 36.48	0.472
Fri.	3	6 47 52.17	10.317	22 59 58.3	11.79	15 46.16	68.72	3 47.68	0.460
Sat.	4	6 51 59.68	10.305	22 55 3.2	12.79	15 46.16	68.68	3 58.60	0.448
Sun.	5	6 56 6.90	10.293	22 49 44.0	13.79	15 46.16	68.63	4 9.23	0.435
Mon.	6	7 0 13.80	10.280	22 44 1.0	14.78	15 46.17	68.58	4 19.54	0.422
Tues.	7	7 4 20.37	10.266	22 37 54.2	15.77	15 46.18	68.53	4 29.53	0.408
Wed.	8	7 8 26.60	10.251	22 31 23.9	16.75	15 46.20	68.48	4 39.17	0.394
Thur.	9	7 12 32.45	10.235	22 24 30.1	17.72	15 46.22	68.43	4 48.44	0.378
Fri.	10	7 16 37.92	10.218	22 17 13.0	18.69	15 46.24	68.37	4 57.33	0.362
Sat.	11	7 20 42.97	10.201	22 9 32.9	19.65	15 46.27	68.31	5 5.80	0.345
Sun.	12	7 24 47.61	10.183	22 1 29.8	20.60	15 46.31	68.25	5 13.86	0.327
Mon.	13	7 28 51.82	10.164	21 53 3.9	21.54	15 46.35	68.19	5 21.50	0.308
Tues.	14	7 32 55.57	10.145	21 44 15.5	22.47	15 46.40	68.12	5 28.67	0.289
Wed.	15	7 36 58.84	10.125	21 35 4.9	23.39	15 46.46	68.05	5 35.37	0.268
Thur.	16	7 41 1.61	10.104	21 25 32.2	24.31	15 46.52	67.98	5 41.55	0.247
Fri.	17	7 45 3.86	10.082	21 15 37.7	25.21	15 46.58	67.91	5 47.23	0.225
Sat.	18	7 49 5.59	10.060	21 5 21.6	26.11	15 46.65	67.84	5 52.39	0.203
Sun.	19	7 53 6.77	10.037	20 54 44.1	26.99	15 46.72	67.76	5 57.01	0.181
Mon.	20	7 57 7.41	10.014	20 43 45.5	27.87	15 46.80	67.68	6 1.09	0.158
Tues.	21	8 1 7.48	9.990	20 32 26.0	28.73	15 46.89	67.60	6 4.59	0.134
Wed.	22	8 5 6.97	9.966	20 20 45.8	29.59	15 46.98	67.52	6 7.51	0.109
Thur.	23	8 9 5.86	9.942	20 8 45.1	30.44	15 47.07	67.44	6 9.84	0.085
Fri.	24	8 13 4.16	9.917	19 56 24.2	31.27	15 47.16	67.36	6 11.58	0.060
Sat.	25	8 17 1.86	9.892	19 43 43.5	32.09	15 47.26	67.28	6 12.72	0.035
Sun.	26	8 20 58.96	9.866	19 30 43.3	32.90	15 47.37	67.20	6 13.25	0.010
Mon.	27	8 24 55.45	9.840	19 17 23.8	33.71	15 47.48	67.11	6 13.18	0.015
Tues.	28	8 28 51.32	9.815	19 3 45.0	34.50	15 47.59	67.02	6 12.51	0.041
Wed.	29	8 32 46.59	9.790	18 49 47.3	35.28	15 47.70	66.93	6 11.23	0.066
Thur.	30	8 36 41.25	9.765	18 35 31.1	36.05	15 47.82	66.85	6 9.34	0.091
Fri.	31	8 40 35.30	9.740	18 20 56.6	36.81	15 47.94	66.77	6 6.85	0.116
Sat.	32	8 44 28.75	9.715	N.18 6 4.0	37.56	15 48.06	66.68	6 3.75	0.141

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		^h ^m ^s	^s	[°] ['] ["]	["]	^m ^s	^s	^h ^m ^s
Wed.	1	6 39 35.76	10.338	N.23 8 36.8	9.78	3 25.00	0.482	6 36 10.76
Thur.	2	6 43 43.77	10.328	23 4 30.0	10.79	3 36.45	0.472	6 40 7.32
Fri.	3	6 47 51.52	10.317	22 59 59.1	11.79	3 47.65	0.460	6 44 3.87
Sat.	4	6 51 59.00	10.305	22 55 4.1	12.79	3 58.57	0.448	6 48 0.43
Sun.	5	6 56 6.19	10.293	22 49 45.0	13.79	4 9.20	0.435	6 51 56.99
Mon.	6	7 0 13.06	10.280	22 44 2.1	14.78	4 19.51	0.422	6 55 53.55
Tues.	7	7 4 19.60	10.266	22 37 55.4	15.77	4 29.50	0.408	6 59 50.10
Wed.	8	7 8 25.80	10.251	22 31 25.2	16.75	4 39.14	0.394	7 3 46.66
Thur.	9	7 12 31.63	10.235	22 24 31.5	17.72	4 48.41	0.378	7 7 43.22
Fri.	10	7 16 37.07	10.218	22 17 14.5	18.69	4 57.30	0.362	7 11 39.77
Sat.	11	7 20 42.10	10.201	22 9 34.5	19.65	5 5.77	0.345	7 15 36.33
Sun.	12	7 24 46.72	10.183	22 1 31.5	20.60	5 13.83	0.327	7 19 32.89
Mon.	13	7 28 50.91	10.164	21 53 5.8	21.54	5 21.47	0.308	7 23 29.44
Tues.	14	7 32 54.64	10.145	21 44 17.6	22.47	5 28.64	0.289	7 27 26.00
Wed.	15	7 36 57.89	10.125	21 35 7.2	23.39	5 35.34	0.268	7 31 22.55
Thur.	16	7 41 0.64	10.104	21 25 34.6	24.31	5 41.53	0.247	7 35 19.11
Fri.	17	7 45 2.88	10.082	21 15 40.2	25.21	5 47.21	0.225	7 39 15.67
Sat.	18	7 49 4.60	10.060	21 5 24.2	26.11	5 52.37	0.203	7 43 12.23
Sun.	19	7 53 5.77	10.037	20 54 46.8	26.99	5 56.99	0.181	7 47 8.78
Mon.	20	7 57 6.40	10.014	20 43 48.3	27.87	6 1.07	0.158	7 51 5.33
Tues.	21	8 1 6.46	9.990	20 32 28.9	28.73	6 4.57	0.134	7 55 1.89
Wed.	22	8 5 5.94	9.966	20 20 48.8	29.59	6 7.49	0.109	7 58 58.45
Thur.	23	8 9 4.83	9.942	20 8 48.2	30.44	6 9.82	0.085	8 2 55.01
Fri.	24	8 13 3.13	9.917	19 56 27.4	31.27	6 11.57	0.060	8 6 51.56
Sat.	25	8 17 0.83	9.892	19 43 46.8	32.09	6 12.71	0.035	8 10 48.12
Sun.	26	8 20 57.93	9.866	19 30 46.7	32.90	6 13.25	0.010	8 14 44.68
Mon.	27	8 24 54.42	9.840	19 17 27.3	33.71	6 13.18	0.015	8 18 41.24
Tues.	28	8 28 50.30	9.815	19 3 48.6	34.50	6 12.51	0.041	8 22 37.79
Wed.	29	8 32 45.58	9.790	18 49 50.9	35.28	6 11.24	0.066	8 26 34.34
Thur.	30	8 36 40.25	9.765	18 35 34.8	36.05	6 9.35	0.091	8 30 30.90
Fri.	31	8 40 34.31	9.740	18 21 0.4	36.81	6 6.86	0.116	8 34 27.45
Sat.	32	8 44 27.77	9.715	N.18 6 7.8	37.56	6 3.76	0.141	8 38 24.01

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE				
		λ	λ'						
1	182	99° 6' 2.8	5 21.5	142.94	+0.43	0.0072017	1.5	17 ^h 20 ^m 58.24	
2	183	100 3 13.4	2 31.9	142.94	0.53	.0072045	0.9	17 17 2.33	
3	184	100 60 24.1	59 42.4	142.95	0.60	.0072057	0.3	17 13 6.41	
4	185	101 57 34.9	56 53.1	142.95	0.64	.0072054	0.4	17 9 10.50	
5	186	102 54 45.9	54 3.9	142.96	0.66	.0072037	1.1	17 5 14.59	
6	187	103 51 57.2	51 15.0	142.98	0.63	.0072002	1.9	17 1 18.68	
7	188	104 49 8.9	48 26.5	143.00	0.59	.0071948	2.7	16 57 22.77	
8	189	105 46 21.0	45 38.5	143.02	0.55	.0071876	3.5	16 53 26.85	
9	190	106 43 33.6	42 51.0	143.03	0.45	.0071784	4.3	16 49 30.94	
10	191	107 40 46.6	40 3.8	143.05	0.33	.0071671	5.2	16 45 35.03	
11	192	108 38 0.2	37 17.2	143.07	0.21	.0071534	6.2	16 41 39.12	
12	193	109 35 14.3	34 31.1	143.10	+0.08	.0071373	7.2	16 37 43.21	
13	194	110 32 28.8	31 45.5	143.12	-0.06	.0071189	8.2	16 33 47.30	
14	195	111 29 43.7	29 0.3	143.14	0.17	.0070979	9.3	16 29 51.39	
15	196	112 26 59.0	26 15.4	143.15	0.27	.0070743	10.4	16 25 55.48	
16	197	113 24 14.8	23 31.0	143.17	0.36	.0070480	11.5	16 21 59.57	
17	198	114 21 31.1	20 47.1	143.18	0.42	.0070190	12.5	16 18 3.66	
18	199	115 18 47.8	18 3.7	143.20	0.44	.0069875	13.6	16 14 7.75	
19	200	116 16 4.9	15 20.7	143.21	0.44	.0069535	14.7	16 10 11.84	
20	201	117 13 22.3	12 37.9	143.23	0.39	.0069171	15.7	16 6 15.93	
21	202	118 10 39.9	9 55.3	143.24	0.34	.0068784	16.6	16 2 20.02	
22	203	119 7 57.8	7 13.0	143.26	0.25	.0068375	17.5	15 58 24.11	
23	204	120 5 16.1	4 31.2	143.27	0.15	.0067946	18.3	15 54 28.20	
24	205	121 2 34.8	1 49.8	143.29	-0.02	.0067497	19.0	15 50 32.29	
25	206	121 59 54.0	59 8.8	143.31	+0.11	.0067080	19.7	15 46 36.38	
26	207	122 57 13.6	56 28.2	143.33	0.25	.0066546	20.4	15 42 40.47	
27	208	123 54 33.7	53 48.2	143.35	0.38	.0066047	21.0	15 38 44.56	
28	209	124 51 54.4	51 8.8	143.38	0.51	.0065535	21.6	15 34 48.65	
29	210	125 49 15.8	48 30.1	143.41	0.60	.0065009	22.2	15 30 52.74	
30	211	126 46 37.9	45 52.0	143.44	0.69	.0064470	22.7	15 26 56.83	
31	212	127 44 0.8	43 14.7	143.48	0.75	.0063918	23.2	15 23 0.92	
32	213	128 41 24.7	40 38.5	143.52	+0.76	0.0063355	23.7	15 19 5.01	

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	16' 45.0	16' 44.7	61' 22.0	+0.12	61' 20.9	-0.29	^h 12 ^m 47.4	^m 2.55	^d 15.2
2	16 43.1	16 40.2	61 15.0	-0.69	61 4.3	1.07	13 47.2	2.41	16.2
3	16 36.1	16 31.1	60 49.4	1.40	60 30.7	1.60	14 43.3	2.27	17.2
4	16 25.1	16 18.5	60 9.0	1.32	59 44.8	2.09	15 36.1	2.15	18.2
5	16 11.5	16 4.2	59 18.8	2.20	58 51.9	2.27	16 26.3	2.06	19.2
6	15 56.7	15 49.2	58 24.5	2.28	57 57.2	2.25	17 14.9	2.01	20.2
7	15 42.0	15 35.0	57 30.4	2.19	57 4.7	2.09	18 2.8	1.99	21.2
8	15 28.3	15 22.0	56 40.2	1.98	56 17.2	1.84	18 50.7	2.00	22.2
9	15 16.2	15 10.9	55 55.9	1.70	55 36.3	1.55	19 39.0	2.03	23.2
10	15 6.1	15 1.7	55 18.6	1.40	55 2.7	1.25	20 27.9	2.05	24.2
11	14 57.9	14 54.6	54 48.6	1.10	54 36.4	0.95	21 17.1	2.05	25.2
12	14 51.7	14 49.3	54 25.9	0.80	54 17.1	0.66	22 6.3	2.04	26.2
13	14 47.4	14 45.8	54 9.9	0.53	54 4.3	0.40	22 54.8	2.00	27.2
14	14 44.7	14 44.0	54 0.2	0.28	53 57.5	-0.17	23 42.1	1.94	28.2
15	14 43.6	14 43.6	53 56.2	-0.05	53 56.2	+0.05	6		29.2
16	14 44.0	14 44.7	53 57.5	+0.16	54 0.1	0.28	0 28.0	1.88	0.5
17	14 45.8	14 47.3	54 4.2	0.40	54 9.6	0.52	1 12.3	1.82	1.5
18	14 49.2	14 51.5	54 16.5	0.64	54 25.0	0.77	1 55.5	1.79	2.5
19	14 54.2	14 57.4	54 35.0	0.91	54 46.7	1.05	2 38.0	1.77	3.5
20	15 1.0	15 5.2	55 0.2	1.19	55 15.4	1.34	3 20.5	1.79	4.5
21	15 9.8	15 14.9	55 32.5	1.49	55 51.2	1.63	4 3.9	1.85	5.5
22	15 20.5	15 26.5	56 11.7	1.77	56 33.8	1.91	4 49.0	1.94	6.5
23	15 33.0	15 39.7	56 57.4	2.02	57 22.4	2.12	5 36.8	2.06	7.5
24	15 46.8	15 54.1	57 48.4	2.20	58 15.1	2.24	6 28.1	2.22	8.5
25	16 1.5	16 8.8	58 42.1	2.24	59 8.9	2.20	7 23.4	2.38	9.5
26	16 15.8	16 22.5	59 34.8	2.10	59 59.3	1.95	8 22.5	2.52	10.5
27	16 28.6	16 33.9	60 21.7	1.75	60 41.3	1.49	9 24.2	2.59	11.5
28	16 38.3	16 41.6	60 57.5	1.18	61 9.7	0.83	10 26.8	2.58	12.5
29	16 43.7	16 44.5	61 17.4	+0.44	61 20.3	+0.04	11 28.1	2.50	13.5
30	16 44.0	16 42.1	61 18.3	-0.37	61 11.3	-0.77	12 26.8	2.38	14.5
31	16 38.9	16 34.6	60 59.7	1.15	60 43.7	1.49	13 22.5	2.26	15.5
32	16 29.2	16 22.9	60 23.9	-1.80	60 0.9	-2.04	14 15.4	2.16	16.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 1.					FRIDAY 3.				
0	18 51 54.48	2.6688	S. 19° 52' 25.8"	6.210	0	20 54 40.55	2.4282	S. 12° 29' 0.6"	11.632
1	18 54 34.51	2.6684	19 46 8.7	6.369	1	20 57 6.07	2.4226	12 17 20.5	11.703
2	18 57 14.33	2.6618	19 39 42.7	6.507	2	20 59 31.25	2.4168	12 5 36.2	11.772
3	18 59 53.93	2.6582	19 33 7.9	6.653	3	21 1 56.09	2.4112	11 53 47.8	11.839
4	19 2 33.32	2.6546	19 26 24.4	6.798	4	21 4 20.59	2.4066	11 41 55.5	11.904
5	19 5 12.48	2.6508	19 19 32.2	6.941	5	21 6 44.76	2.4000	11 29 59.3	11.968
6	19 7 51.41	2.6468	19 12 31.5	7.083	6	21 9 8.59	2.3944	11 17 59.3	12.030
7	19 10 30.10	2.6428	19 5 22.2	7.224	7	21 11 32.09	2.3889	11 5 55.7	12.089
8	19 13 8.55	2.6387	18 58 4.6	7.363	8	21 13 55.26	2.3834	10 53 48.6	12.147
9	19 15 46.75	2.6345	18 50 38.6	7.502	9	21 16 18.10	2.3779	10 41 38.0	12.204
10	19 18 24.69	2.6302	18 43 4.3	7.640	10	21 18 40.61	2.3724	10 29 24.1	12.259
11	19 21 2.38	2.6259	18 35 21.8	7.776	11	21 21 2.79	2.3670	10 17 6.9	12.312
12	19 23 39.80	2.6214	18 27 31.2	7.910	12	21 23 24.65	2.3617	10 4 46.6	12.363
13	19 26 16.95	2.6168	18 19 32.6	8.043	13	21 25 46.19	2.3563	9 52 23.3	12.412
14	19 28 53.82	2.6122	18 11 26.1	8.173	14	21 28 7.40	2.3509	9 39 57.1	12.460
15	19 31 30.41	2.6074	18 3 11.8	8.302	15	21 30 28.30	2.3457	9 27 28.1	12.506
16	19 34 6.71	2.6027	17 54 49.8	8.431	16	21 32 48.88	2.3404	9 14 56.4	12.550
17	19 36 42.73	2.5978	17 46 20.1	8.558	17	21 35 9.15	2.3352	9 2 22.1	12.593
18	19 39 18.45	2.5929	17 37 42.9	8.683	18	21 37 29.10	2.3299	8 49 45.3	12.634
19	19 41 53.88	2.5880	17 28 58.2	8.806	19	21 39 48.74	2.3248	8 37 6.0	12.674
20	19 44 29.01	2.5829	17 20 6.2	8.928	20	21 42 8.08	2.3196	8 24 24.4	12.712
21	19 47 3.83	2.5778	17 11 6.9	9.048	21	21 44 27.12	2.3148	8 11 40.6	12.748
22	19 49 38.35	2.5727	17 2 0.5	9.166	22	21 46 45.85	2.3097	7 58 54.6	12.782
23	19 52 12.56	2.5675	S. 16 52 47.0	9.283	23	21 49 4.28	2.3047	S. 7 46 6.7	12.814
THURSDAY 2.					SATURDAY 4.				
0	19 54 46.45	2.5622	S. 16 43 26.5	9.396	0	21 51 22.42	2.2998	S. 7 33 16.9	12.845
1	19 57 20.03	2.5569	16 33 59.2	9.512	1	21 53 40.26	2.2950	7 20 25.3	12.876
2	19 59 53.28	2.5515	16 24 25.1	9.623	2	21 55 57.82	2.2902	7 7 31.9	12.903
3	20 2 26.21	2.5462	16 14 44.4	9.733	3	21 58 15.09	2.2854	6 54 36.9	12.930
4	20 4 58.82	2.5408	16 4 57.1	9.842	4	22 0 32.07	2.2807	6 41 40.3	12.955
5	20 7 31.10	2.5353	15 55 3.4	9.948	5	22 2 48.77	2.2760	6 28 42.3	12.978
6	20 10 3.06	2.5298	15 45 3.4	10.053	6	22 5 5.19	2.2714	6 15 43.0	12.999
7	20 12 34.68	2.5242	15 34 57.1	10.156	7	22 7 21.34	2.2668	6 2 42.4	13.020
8	20 15 5.97	2.5187	15 24 44.7	10.257	8	22 9 37.21	2.2623	5 49 40.6	13.039
9	20 17 36.93	2.5132	15 14 26.3	10.356	9	22 11 52.81	2.2578	5 36 37.7	13.056
10	20 20 7.55	2.5075	15 4 2.0	10.454	10	22 14 8.15	2.2533	5 23 33.9	13.071
11	20 22 37.83	2.5018	14 53 31.8	10.550	11	22 16 23.23	2.2489	5 10 29.2	13.086
12	20 25 7.77	2.4962	14 42 56.0	10.644	12	22 18 38.05	2.2448	4 57 23.7	13.098
13	20 27 37.38	2.4906	14 32 14.6	10.736	13	22 20 52.61	2.2406	4 44 17.5	13.109
14	20 30 6.64	2.4849	14 21 27.7	10.827	14	22 23 6.92	2.2364	4 31 10.6	13.119
15	20 32 35.57	2.4792	14 10 35.4	10.916	15	22 25 20.98	2.2323	4 18 3.2	13.127
16	20 35 4.15	2.4736	13 59 37.8	11.003	16	22 27 34.80	2.2282	4 4 55.3	13.135
17	20 37 32.40	2.4679	13 48 35.1	11.088	17	22 29 48.37	2.2242	3 51 47.0	13.141
18	20 40 0.30	2.4622	13 37 27.3	11.171	18	22 32 1.71	2.2203	3 38 38.4	13.145
19	20 42 27.86	2.4565	13 26 14.6	11.252	19	22 34 14.81	2.2164	3 25 29.6	13.148
20	20 44 55.08	2.4508	13 14 57.0	11.332	20	22 36 27.68	2.2126	3 12 20.7	13.149
21	20 47 21.96	2.4452	13 3 34.7	11.410	21	22 38 40.32	2.2088	2 59 11.7	13.149
22	20 49 48.50	2.4394	12 52 7.8	11.486	22	22 40 52.74	2.2052	2 46 2.8	13.148
23	20 52 14.69	2.4338	12 40 36.4	11.560	23	22 43 4.94	2.2015	2 32 54.0	13.145
24	20 54 40.55	2.4282	S. 12 29 0.6	11.632	24	22 45 16.92	2.1979	S. 2 19 45.4	13.141

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 5.					TUESDAY 7.				
0	22 45 16.92	2.1979	S. 2° 19' 45.4	13.141	0	0 27 48.75	2.0968	N. 7° 44' 43.4	11.656
1	22 47 28.69	2.1944	2 6 37.1	13.136	1	0 29 54.54	2.0961	7 56 21.1	11.601
2	22 49 40.25	2.1909	1 53 29.1	13.130	2	0 32 0.28	2.0953	8 7 55.5	11.547
3	22 51 51.60	2.1875	1 40 21.5	13.122	3	0 34 5.98	2.0947	8 19 26.7	11.492
4	22 54 2.75	2.1842	1 27 14.4	13.113	4	0 36 11.65	2.0942	8 30 54.5	11.435
5	22 56 13.70	2.1809	1 14 7.9	13.104	5	0 38 17.28	2.0936	8 42 18.9	11.378
6	22 58 24.46	2.1777	1 1 2.0	13.092	6	0 40 22.88	2.0931	8 53 39.9	11.321
7	23 0 35.03	2.1746	0 47 56.9	13.079	7	0 42 28.45	2.0927	9 4 57.4	11.262
8	23 2 45.41	2.1715	0 34 52.5	13.066	8	0 44 34.00	2.0923	9 16 11.3	11.202
9	23 4 55.61	2.1684	0 21 49.0	13.050	9	0 46 39.53	2.0919	9 27 21.7	11.143
10	23 7 5.62	2.1654	S. 0 8 46.5	13.034	10	0 48 45.03	2.0916	9 38 28.5	11.082
11	23 9 15.46	2.1626	N. 0 4 15.1	13.017	11	0 50 50.52	2.0913	9 49 31.6	11.021
12	23 11 25.13	2.1598	0 17 15.6	12.998	12	0 52 55.99	2.0911	10 0 31.0	10.959
13	23 13 34.63	2.1570	0 30 14.9	12.978	13	0 55 1.45	2.0909	10 11 26.7	10.897
14	23 15 43.97	2.1543	0 43 13.0	12.957	14	0 57 6.90	2.0908	10 22 18.6	10.833
15	23 17 53.14	2.1515	0 56 9.8	12.936	15	0 59 12.35	2.0907	10 33 6.7	10.769
16	23 20 2.15	2.1489	1 9 5.3	12.913	16	1 1 17.79	2.0906	10 43 50.9	10.704
17	23 22 11.01	2.1464	1 21 59.4	12.889	17	1 3 23.22	2.0906	10 54 31.2	10.638
18	23 24 19.72	2.1440	1 34 52.0	12.864	18	1 5 28.66	2.0907	11 5 7.5	10.572
19	23 26 28.29	2.1416	1 47 43.1	12.837	19	1 7 34.10	2.0907	11 15 39.9	10.506
20	23 28 36.71	2.1392	2 0 32.5	12.809	20	1 9 39.54	2.0908	11 26 8.2	10.438
21	23 30 44.99	2.1369	2 13 20.2	12.780	21	1 11 44.99	2.0909	11 36 32.5	10.370
22	23 32 53.14	2.1347	2 26 6.1	12.752	22	1 13 50.45	2.0911	11 46 52.6	10.301
23	23 35 1.15	2.1326	N. 2 38 50.4	12.723	23	1 15 55.92	2.0913	N. 11 57 8.6	10.232
MONDAY 6.					WEDNESDAY 8.				
0	23 37 9.04	2.1304	N. 2 51 32.9	12.692	0	1 18 1.41	2.0916	N. 12 7 20.4	10.162
1	23 39 16.80	2.1283	3 4 13.4	12.658	1	1 20 6.91	2.0918	12 17 28.0	10.091
2	23 41 24.44	2.1263	3 16 51.9	12.624	2	1 22 12.43	2.0921	12 27 31.3	10.019
3	23 43 31.96	2.1244	3 29 28.3	12.589	3	1 24 17.96	2.0924	12 37 30.3	9.947
4	23 45 39.37	2.1226	3 42 2.6	12.554	4	1 26 23.52	2.0928	12 47 25.0	9.875
5	23 47 46.67	2.1208	3 54 34.8	12.518	5	1 28 29.10	2.0932	12 57 15.3	9.802
6	23 49 53.86	2.1189	4 7 4.8	12.481	6	1 30 34.71	2.0937	13 7 1.2	9.728
7	23 52 0.94	2.1172	4 19 32.5	12.443	7	1 32 40.34	2.0941	13 16 42.7	9.654
8	23 54 7.92	2.1156	4 31 57.9	12.403	8	1 34 46.00	2.0946	13 26 19.7	9.578
9	23 56 14.81	2.1140	4 44 20.9	12.363	9	1 36 51.69	2.0951	13 35 52.1	9.504
10	23 58 21.60	2.1124	4 56 41.5	12.322	10	1 38 57.41	2.0957	13 45 20.0	9.427
11	0 0 28.30	2.1110	5 8 59.5	12.280	11	1 41 3.17	2.0963	13 54 43.3	9.350
12	0 2 34.92	2.1096	5 21 15.0	12.237	12	1 43 8.97	2.0969	14 4 2.0	9.272
13	0 4 41.45	2.1082	5 33 27.9	12.193	13	1 45 14.80	2.0975	14 13 16.0	9.195
14	0 6 47.90	2.1069	5 45 38.2	12.148	14	1 47 20.67	2.0981	14 22 25.4	9.117
15	0 8 54.28	2.1057	5 57 45.7	12.102	15	1 49 26.57	2.0988	14 31 30.0	9.037
16	0 11 0.59	2.1046	6 9 50.5	12.056	16	1 51 32.52	2.0995	14 40 29.8	8.957
17	0 13 6.83	2.1033	6 21 52.5	12.009	17	1 53 38.51	2.1002	14 49 24.9	8.877
18	0 15 12.99	2.1022	6 33 51.6	11.961	18	1 55 44.54	2.1009	14 58 15.1	8.797
19	0 17 19.09	2.1012	6 45 47.8	11.912	19	1 57 50.62	2.1017	15 7 0.5	8.716
20	0 19 25.13	2.1002	6 57 41.0	11.863	20	1 59 56.74	2.1024	15 15 41.0	8.634
21	0 21 31.11	2.0993	7 9 31.2	11.813	21	2 2 2.91	2.1032	15 24 16.6	8.552
22	0 23 37.04	2.0984	7 21 18.4	11.761	22	2 4 9.13	2.1040	15 32 47.2	8.469
23	0 25 42.92	2.0976	7 33 2.5	11.708	23	2 6 15.39	2.1049	15 41 12.9	8.386
24	0 27 48.75	2.0968	N. 7 44 43.4	11.656	24	2 8 21.71	2.1057	N. 15 49 33.5	8.302

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 9.					SATURDAY 11.				
0	2 8 21.71	2.1087	N.15° 49' 33.5	8.302	0	3 50 28.56	2.1466	N.20° 43' 2.4	3.784
1	2 10 28.08	2.1086	15 57 49.1	8.218	1	3 52 37.37	2.1471	20 46 46.4	3.682
2	2 12 34.50	2.1074	16 5 59.6	8.132	2	3 54 46.21	2.1476	20 50 24.3	3.680
3	2 14 40.97	2.1063	16 14 5.0	8.047	3	3 56 55.08	2.1480	20 53 56.0	3.478
4	2 16 47.49	2.1092	16 22 5.3	7.962	4	3 59 3.97	2.1484	20 57 21.6	3.376
5	2 18 54.07	2.1101	16 30 0.4	7.876	5	4 1 12.89	2.1488	21 0 41.1	3.273
6	2 21 0.70	2.1109	16 37 50.3	7.788	6	4 3 21.83	2.1492	21 3 54.4	3.170
7	2 23 7.38	2.1118	16 45 35.0	7.702	7	4 5 30.80	2.1496	21 7 1.5	3.067
8	2 25 14.12	2.1128	16 53 14.5	7.614	8	4 7 39.79	2.1499	21 10 2.4	2.964
9	2 27 20.92	2.1137	17 0 48.7	7.526	9	4 9 48.79	2.1502	21 12 57.2	2.861
10	2 29 27.77	2.1147	17 8 17.6	7.437	10	4 11 57.81	2.1505	21 15 45.7	2.757
11	2 31 34.68	2.1157	17 15 41.1	7.347	11	4 14 6.85	2.1507	21 18 28.1	2.654
12	2 33 41.65	2.1168	17 22 59.2	7.257	12	4 16 15.90	2.1509	21 21 4.2	2.550
13	2 35 48.67	2.1175	17 30 12.0	7.168	13	4 18 24.96	2.1511	21 23 34.1	2.447
14	2 37 55.75	2.1185	17 37 19.3	7.077	14	4 20 34.03	2.1512	21 25 57.8	2.343
15	2 40 2.89	2.1195	17 44 21.2	6.987	15	4 22 43.11	2.1513	21 28 15.2	2.238
16	2 42 10.09	2.1205	17 51 17.7	6.896	16	4 24 52.19	2.1514	21 30 26.4	2.134
17	2 44 17.35	2.1214	17 58 8.7	6.803	17	4 27 1.28	2.1515	21 32 31.3	2.030
18	2 46 24.66	2.1223	18 4 54.1	6.711	18	4 29 10.37	2.1516	21 34 30.0	1.927
19	2 48 32.03	2.1232	18 11 34.0	6.618	19	4 31 19.45	2.1513	21 36 22.5	1.823
20	2 50 39.45	2.1242	18 18 8.3	6.525	20	4 33 28.53	2.1513	21 38 8.7	1.717
21	2 52 46.93	2.1252	18 24 37.0	6.431	21	4 35 37.61	2.1512	21 39 48.6	1.613
22	2 54 54.47	2.1262	18 31 0.1	6.338	22	4 37 46.68	2.1511	21 41 22.3	1.509
23	2 57 2.07	2.1271	N.18 37 17.6	6.244	23	4 39 55.74	2.1509	N.21 42 49.7	1.404
FRIDAY 10.					SUNDAY 12.				
0	2 59 9.72	2.1280	N.18 43 29.4	6.149	0	4 42 4.79	2.1507	N.21 44 10.8	1.300
1	3 1 17.43	2.1290	18 49 35.5	6.055	1	4 44 13.82	2.1504	21 45 25.7	1.196
2	3 3 25.20	2.1299	18 55 36.0	5.960	2	4 46 22.84	2.1501	21 46 34.3	1.091
3	3 5 33.02	2.1308	19 1 30.7	5.864	3	4 48 31.84	2.1498	21 47 36.6	0.987
4	3 7 40.89	2.1316	19 7 19.7	5.768	4	4 50 40.82	2.1495	21 48 32.7	0.882
5	3 9 48.81	2.1325	19 13 2.9	5.673	5	4 52 49.78	2.1491	21 49 22.5	0.778
6	3 11 56.79	2.1334	19 18 40.3	5.575	6	4 54 58.71	2.1486	21 50 6.1	0.674
7	3 14 4.82	2.1343	19 24 11.9	5.478	7	4 57 7.61	2.1481	21 50 43.4	0.569
8	3 16 12.91	2.1352	19 29 37.7	5.381	8	4 59 16.48	2.1476	21 51 14.4	0.465
9	3 18 21.05	2.1361	19 34 57.6	5.283	9	5 1 25.32	2.1471	21 51 39.2	0.361
10	3 20 29.24	2.1369	19 40 11.6	5.185	10	5 3 34.13	2.1465	21 51 57.7	0.257
11	3 22 37.48	2.1377	19 45 19.8	5.087	11	5 5 42.90	2.1458	21 52 10.0	0.153
12	3 24 45.76	2.1384	19 50 22.1	4.989	12	5 7 51.63	2.1452	21 52 16.1	0.049
13	3 26 54.09	2.1392	19 55 18.4	4.889	13	5 10 0.32	2.1445	21 52 15.9	0.045
14	3 29 2.47	2.1401	20 0 08.8	4.790	14	5 12 8.97	2.1437	21 52 9.5	0.158
15	3 31 10.90	2.1408	20 4 53.2	4.691	15	5 14 17.57	2.1429	21 51 56.9	0.262
16	3 33 19.37	2.1416	20 9 31.7	4.592	16	5 16 26.12	2.1421	21 51 38.1	0.365
17	3 35 27.88	2.1422	20 14 4.2	4.492	17	5 18 34.62	2.1412	21 51 13.1	0.468
18	3 37 36.44	2.1429	20 18 30.7	4.391	18	5 20 43.07	2.1403	21 50 41.9	0.572
19	3 39 45.03	2.1435	20 22 51.1	4.290	19	5 22 51.46	2.1394	21 50 4.5	0.673
20	3 41 53.66	2.1442	20 27 5.5	4.189	20	5 24 59.80	2.1385	21 49 20.9	0.777
21	3 44 2.33	2.1448	20 31 13.8	4.088	21	5 27 8.08	2.1374	21 48 31.2	0.880
22	3 46 11.04	2.1454	20 35 16.1	3.987	22	5 29 16.29	2.1363	21 47 35.3	0.983
23	3 48 19.78	2.1460	20 39 12.3	3.886	23	5 31 24.44	2.1353	21 46 33.2	1.086
24	3 50 28.56	2.1466	N.20 43 2.4	3.784	24	5 33 32.53	2.1342	N.21 45 25.0	1.188

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 13.					WEDNESDAY 15.				
0	h m s	°	N. 21° 45' 25.0"	1.188	0	h m s	°	N. 18° 56' 26.5"	5.704
1	5 33 32.53	2.1342	21 44 10.7	1.289	1	7 16 6.70	2.0421	18 50 41.7	5.787
2	5 37 48.49	2.1318	21 42 50.3	1.391	2	7 18 9.15	2.0397	18 44 52.0	5.870
3	5 39 56.36	2.1306	21 41 23.8	1.493	3	7 20 11.46	2.0373	18 38 57.3	5.952
4	5 42 4.16	2.1293	21 39 51.2	1.594	4	7 22 13.63	2.0349	18 32 57.7	6.034
5	5 44 11.88	2.1280	21 38 12.6	1.694	5	7 24 15.65	2.0325	18 26 53.2	6.115
6	5 46 19.52	2.1267	21 36 27.9	1.796	6	7 26 17.53	2.0302	18 20 43.9	6.196
7	5 48 27.08	2.1253	21 34 37.2	1.896	7	7 28 19.27	2.0278	18 14 29.7	6.276
8	5 50 34.55	2.1238	21 32 40.4	1.997	8	7 30 20.86	2.0253	18 8 10.8	6.356
9	5 52 41.94	2.1224	21 30 37.6	2.097	9	7 32 22.31	2.0229	18 1 47.1	6.434
10	5 54 49.24	2.1209	21 28 28.8	2.196	10	7 34 23.61	2.0204	17 55 18.7	6.512
11	5 56 56.45	2.1193	21 26 14.1	2.295	11	7 36 24.76	2.0180	17 48 45.6	6.590
12	5 59 3.56	2.1178	21 23 53.4	2.394	12	7 38 25.77	2.0156	17 42 7.9	6.667
13	6 1 10.58	2.1163	21 21 26.8	2.493	13	7 40 26.63	2.0132	17 35 25.6	6.743
14	6 3 17.51	2.1147	21 18 54.2	2.592	14	7 42 27.35	2.0107	17 28 38.7	6.820
15	6 5 24.34	2.1130	21 16 15.7	2.691	15	7 44 27.92	2.0083	17 21 47.2	6.896
16	6 7 31.07	2.1113	21 13 31.3	2.788	16	7 46 28.35	2.0059	17 14 51.2	6.971
17	6 9 37.70	2.1097	21 10 41.1	2.885	17	7 48 28.63	2.0035	17 7 50.7	7.045
18	6 11 44.23	2.1079	21 7 45.1	2.982	18	7 50 28.77	2.0011	17 0 45.8	7.118
19	6 13 50.65	2.1061	21 4 43.2	3.080	19	7 52 28.76	1.9987	16 53 36.5	7.192
20	6 15 56.96	2.1042	21 1 35.5	3.177	20	7 54 28.61	1.9962	16 46 22.8	7.264
21	6 18 3.16	2.1024	20 58 22.0	3.273	21	7 56 28.31	1.9938	16 39 4.8	7.336
22	6 20 9.25	2.1006	20 55 2.8	3.368	22	7 58 27.87	1.9915	16 31 42.5	7.407
23	6 22 15.23	2.0987	N. 20° 51' 37.9"	3.463	23	8 0 27.29	1.9892	N. 16° 24' 15.9"	7.478
TUESDAY 14.					THURSDAY 16.				
0	h m s	°	N. 20° 48' 7.3"	3.557	0	h m s	°	N. 16° 16' 45.1"	7.548
1	6 24 21.10	2.0968	20 44 31.0	3.652	1	8 4 25.70	1.9843	16 9 10.1	7.618
2	6 26 26.85	2.0948	20 40 49.0	3.747	2	8 6 24.69	1.9820	16 1 31.0	7.687
3	6 28 32.48	2.0929	20 37 1.4	3.840	3	8 8 23.54	1.9797	15 53 47.7	7.756
4	6 30 38.00	2.0909	20 33 8.2	3.933	4	8 10 22.25	1.9773	15 46 0.3	7.823
5	6 32 43.39	2.0888	20 29 9.4	4.027	5	8 12 20.82	1.9750	15 38 8.9	7.890
6	6 34 48.66	2.0868	20 25 5.0	4.119	6	8 14 19.25	1.9727	15 30 13.5	7.957
7	6 36 53.81	2.0848	20 20 55.1	4.211	7	8 16 17.54	1.9703	15 22 14.1	8.023
8	6 38 58.84	2.0827	20 16 39.7	4.302	8	8 18 15.69	1.9681	15 14 10.8	8.088
9	6 41 3.74	2.0806	20 12 18.8	4.393	9	8 20 13.71	1.9659	15 6 3.6	8.152
10	6 43 8.51	2.0785	20 7 52.5	4.484	10	8 22 11.60	1.9635	14 57 52.6	8.216
11	6 45 13.16	2.0763	20 3 20.7	4.575	11	8 24 9.34	1.9612	14 49 37.7	8.280
12	6 47 17.67	2.0742	19 58 43.5	4.666	12	8 26 6.95	1.9591	14 41 19.0	8.343
13	6 49 22.06	2.0720	19 54 0.9	4.754	13	8 28 4.43	1.9569	14 32 56.6	8.405
14	6 51 26.31	2.0698	19 49 13.0	4.843	14	8 30 1.78	1.9547	14 24 30.4	8.467
15	6 53 30.43	2.0676	19 44 19.8	4.931	15	8 31 59.00	1.9526	14 16 0.6	8.528
16	6 55 34.42	2.0653	19 39 21.3	5.018	16	8 33 56.09	1.9504	14 7 27.1	8.588
17	6 57 38.27	2.0630	19 34 17.6	5.106	17	8 35 53.05	1.9482	13 58 50.0	8.647
18	6 59 41.98	2.0607	19 29 8.6	5.193	18	8 37 49.88	1.9461	13 50 9.4	8.706
19	7 1 45.56	2.0586	19 23 54.4	5.280	19	8 39 46.59	1.9442	13 41 25.3	8.764
20	7 3 49.00	2.0562	19 18 35.0	5.366	20	8 41 43.18	1.9421	13 32 37.7	8.822
21	7 5 52.30	2.0538	19 13 10.5	5.451	21	8 43 39.64	1.9400	13 23 46.6	8.880
22	7 7 55.46	2.0515	19 7 40.9	5.536	22	8 45 35.98	1.9380	13 14 52.1	8.936
23	7 9 58.48	2.0492	19 2 6.2	5.620	23	8 47 32.20	1.9360	13 5 54.3	8.992
24	7 12 1.36	2.0468	N. 18° 56' 26.5"	5.704	24	8 49 28.30	1.9341	N. 12° 56' 53.1"	9.047

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 17.					SUNDAY 19.				
0	8 49 28.30	1.9341	N. 12 56 53.1	9.047	0	10 20 39.11	1.8799	N. 4 51 0.1	10.963
1	8 51 24.29	1.9322	12 47 48.6	9.102	1	10 22 31.90	1.8798	4 40 2.2	10.977
2	8 53 20.16	1.9302	12 38 40.9	9.156	2	10 24 24.68	1.8797	4 29 2.8	11.001
3	8 55 15.91	1.9283	12 29 29.9	9.209	3	10 26 17.46	1.8797	4 18 2.1	11.023
4	8 57 11.55	1.9264	12 20 15.8	9.262	4	10 28 10.24	1.8797	4 7 0.0	11.046
5	8 59 7.08	1.9246	12 10 58.5	9.314	5	10 30 3.03	1.8798	3 55 56.6	11.068
6	9 1 2.50	1.9228	12 1 38.1	9.366	6	10 31 55.82	1.8799	3 44 51.9	11.088
7	9 2 57.82	1.9211	11 52 14.6	9.417	7	10 33 48.62	1.8802	3 33 46.0	11.108
8	9 4 53.03	1.9193	11 42 48.1	9.467	8	10 35 41.44	1.8804	3 22 38.9	11.127
9	9 6 48.14	1.9176	11 33 18.6	9.516	9	10 37 34.27	1.8807	3 11 30.7	11.147
10	9 8 43.14	1.9158	11 23 46.2	9.565	10	10 39 27.13	1.8812	3 0 21.3	11.165
11	9 10 38.04	1.9142	11 14 10.8	9.613	11	10 41 20.01	1.8816	2 49 10.9	11.183
12	9 12 32.85	1.9127	11 4 32.6	9.661	12	10 43 12.91	1.8819	2 37 59.4	11.200
13	9 14 27.56	1.9111	10 54 51.5	9.708	13	10 45 5.84	1.8824	2 26 46.9	11.217
14	9 16 22.18	1.9095	10 45 7.6	9.754	14	10 46 58.80	1.8830	2 15 33.4	11.233
15	9 18 16.70	1.9080	10 35 21.0	9.800	15	10 48 51.80	1.8837	2 4 19.1	11.246
16	9 20 11.14	1.9066	10 25 31.6	9.845	16	10 50 44.84	1.8843	1 53 3.9	11.261
17	9 22 5.49	1.9051	10 15 39.6	9.889	17	10 52 37.92	1.8851	1 41 47.8	11.275
18	9 23 59.75	1.9037	10 5 44.9	9.933	18	10 54 31.05	1.8856	1 30 30.9	11.288
19	9 25 53.93	1.9022	9 55 47.6	9.977	19	10 56 24.22	1.8867	1 19 13.3	11.299
20	9 27 48.02	1.9008	9 45 47.7	10.019	20	10 58 17.45	1.8876	1 7 55.0	11.311
21	9 29 42.03	1.8996	9 35 45.3	10.062	21	11 0 10.73	1.8885	0 56 36.0	11.322
22	9 31 35.97	1.8983	9 25 40.3	10.103	22	11 2 4.07	1.8895	0 45 16.3	11.333
23	9 33 29.83	1.8971	N. 9 15 32.9	10.143	23	11 3 57.47	1.8905	N. 0 33 56.0	11.343
SATURDAY 18.					MONDAY 20.				
0	9 35 23.62	1.8959	N. 9 5 23.1	10.183	0	11 5 50.93	1.8916	N. 0 22 35.2	11.351
1	9 37 17.34	1.8948	8 55 10.9	10.223	1	11 7 44.46	1.8928	N. 0 11 13.9	11.360
2	9 39 10.99	1.8937	8 44 56.3	10.262	2	11 9 38.06	1.8940	S. 0 0 7.9	11.368
3	9 41 4.58	1.8926	8 34 39.4	10.300	3	11 11 31.74	1.8953	0 11 30.2	11.374
4	9 42 58.10	1.8915	8 24 20.3	10.337	4	11 13 25.50	1.8967	0 22 52.8	11.380
5	9 44 51.56	1.8905	8 13 58.9	10.375	5	11 15 19.34	1.8981	0 34 15.8	11.386
6	9 46 44.96	1.8896	8 3 35.3	10.411	6	11 17 13.27	1.8996	0 45 39.1	11.391
7	9 48 38.31	1.8887	7 53 9.6	10.446	7	11 19 7.28	1.9009	0 57 2.7	11.395
8	9 50 31.60	1.8877	7 42 41.8	10.481	8	11 21 1.38	1.9025	1 8 26.5	11.398
9	9 52 24.84	1.8869	7 32 11.9	10.516	9	11 22 55.58	1.9041	1 19 50.5	11.401
10	9 54 18.03	1.8862	7 21 39.9	10.549	10	11 24 49.87	1.9058	1 31 14.6	11.403
11	9 56 11.18	1.8854	7 11 6.0	10.582	11	11 26 44.27	1.9076	1 42 38.8	11.404
12	9 58 4.28	1.8847	7 0 30.1	10.614	12	11 28 38.78	1.9094	1 54 3.1	11.406
13	9 59 57.34	1.8840	6 49 52.3	10.646	13	11 30 33.40	1.9113	2 5 27.4	11.404
14	10 1 50.36	1.8834	6 39 12.6	10.677	14	11 32 28.13	1.9131	2 16 51.6	11.408
15	10 3 43.35	1.8829	6 28 31.0	10.708	15	11 34 22.97	1.9150	2 28 15.8	11.402
16	10 5 36.31	1.8824	6 17 47.6	10.738	16	11 36 17.93	1.9171	2 39 39.9	11.400
17	10 7 29.24	1.8819	6 7 2.5	10.767	17	11 38 13.02	1.9192	2 51 3.8	11.397
18	10 9 22.14	1.8814	5 56 15.6	10.796	18	11 40 8.24	1.9214	3 2 27.5	11.393
19	10 11 15.01	1.8810	5 45 27.0	10.823	19	11 42 3.59	1.9235	3 13 59.9	11.388
20	10 13 7.86	1.8807	5 34 36.8	10.850	20	11 43 59.07	1.9258	3 25 14.1	11.383
21	10 15 0.69	1.8804	5 23 45.0	10.877	21	11 45 54.69	1.9282	3 36 36.9	11.377
22	10 16 53.51	1.8802	5 12 51.6	10.903	22	11 47 50.45	1.9305	3 47 59.4	11.371
23	10 18 46.31	1.8800	5 1 56.6	10.929	23	11 49 46.35	1.9329	3 59 21.4	11.363
24	10 20 39.11	1.8799	N. 4 51 0.1	10.953	24	11 51 42.40	1.9355	S. 4 10 43.0	11.355

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 21.					THURSDAY 23.				
0	h m s	s	S. 4 10' 43.0"	"	0	h m s	s	S. 12 50' 30.6"	"
1	11 51 42.40	1.9365	4 22 4.0	11.346	1	13 28 38.22	2.1287	13 0 26.3	9.984
2	11 53 38.61	1.9381	4 33 24.5	11.337	2	13 30 45.92	2.1310	13 10 18.7	9.901
3	11 55 34.97	1.9407	4 44 44.4	11.326	3	13 32 53.94	2.1363	13 20 7.8	9.846
4	11 57 31.49	1.9433	4 56 3.6	11.314	4	13 35 2.28	2.1417	13 29 53.6	9.791
5	12 1 25.02	1.9461	5 7 22.1	11.302	5	13 37 10.95	2.1472	13 39 36.0	9.735
6	12 3 22.04	1.9489	5 18 39.9	11.290	6	13 39 19.95	2.1528	13 49 14.9	9.678
7	12 5 19.23	1.9518	5 29 56.9	11.277	7	13 41 29.29	2.1584	13 58 50.3	9.619
8	12 7 16.60	1.9547	5 41 13.1	11.262	8	13 43 38.96	2.1639	14 8 22.0	9.559
9	12 9 14.15	1.9577	5 52 28.3	11.246	9	13 45 48.96	2.1695	14 17 50.0	9.498
10	12 11 11.89	1.9606	6 3 42.6	11.230	10	13 47 59.30	2.1762	14 27 14.3	9.436
11	12 13 9.81	1.9638	6 14 55.9	11.213	11	13 50 9.99	2.1810	14 36 34.8	9.373
12	12 15 7.93	1.9670	6 26 8.2	11.196	12	13 52 21.02	2.1868	14 45 51.4	9.309
13	12 17 6.24	1.9702	6 37 19.4	11.177	13	13 54 32.40	2.1926	14 55 4.0	9.244
14	12 19 4.75	1.9735	6 48 29.4	11.158	14	13 56 44.13	2.1984	15 4 12.6	9.177
15	12 21 3.47	1.9769	6 59 38.3	11.137	15	13 58 56.21	2.2042	15 13 17.0	9.108
16	12 23 2.40	1.9804	7 10 45.9	11.116	16	14 1 8.65	2.2102	15 22 17.3	9.039
17	12 25 1.54	1.9839	7 21 52.2	11.094	17	14 3 21.44	2.2162	15 31 13.3	8.969
18	12 27 0.89	1.9874	7 32 57.2	11.072	18	14 5 34.59	2.2222	15 40 5.0	8.897
19	12 29 0.45	1.9909	7 44 0.8	11.048	19	14 7 48.10	2.2282	15 48 52.3	8.825
20	12 31 0.23	1.9945	7 55 2.9	11.023	20	14 10 1.97	2.2342	15 57 35.1	8.751
21	12 33 0.24	1.9983	8 6 3.5	11.008	21	14 12 16.20	2.2403	16 6 13.3	8.675
22	12 35 0.48	2.0021	8 17 2.6	10.982	22	14 14 30.80	2.2463	16 14 47.0	8.599
23	12 37 0.95	2.0060	8 28 0.1	10.954	23	14 16 45.76	2.2524	16 23 16.0	8.522
WEDNESDAY 22.					FRIDAY 24.				
0	h m s	s	S. 8 38 55.9	"	0	h m s	s	S. 16 31 40.2	"
1	12 39 1.66	2.0138	8 49 50.0	10.916	1	14 21 16.79	2.2647	16 39 59.6	8.363
2	12 41 2.61	2.0178	9 0 42.4	10.887	2	14 23 32.86	2.2709	16 48 14.0	8.282
3	12 43 3.80	2.0218	9 11 32.9	10.857	3	14 25 49.31	2.2772	16 56 23.5	8.199
4	12 45 5.23	2.0259	9 22 21.5	10.826	4	14 28 6.13	2.2835	17 4 27.9	8.116
5	12 47 6.91	2.0302	9 33 8.2	10.794	5	14 30 23.33	2.2897	17 12 27.1	8.030
6	12 49 8.85	2.0344	9 43 52.9	10.762	6	14 32 40.90	2.2960	17 20 21.1	7.944
7	12 51 11.04	2.0387	9 54 35.6	10.728	7	14 34 58.85	2.3022	17 28 9.8	7.856
8	12 53 13.49	2.0431	10 5 16.2	10.694	8	14 37 17.17	2.3085	17 35 53.1	7.767
9	12 55 16.21	2.0475	10 15 54.6	10.658	9	14 39 35.87	2.3148	17 43 31.0	7.677
10	12 57 19.19	2.0519	10 26 30.8	10.622	10	14 41 54.95	2.3212	17 51 3.4	7.586
11	12 59 22.44	2.0565	10 37 4.7	10.584	11	14 44 14.41	2.3276	17 58 30.1	7.493
12	13 1 25.97	2.0611	10 47 36.2	10.545	12	14 46 34.26	2.3339	18 5 51.1	7.398
13	13 3 29.77	2.0657	10 58 5.4	10.506	13	14 48 54.48	2.3402	18 13 6.4	7.302
14	13 5 33.85	2.0704	11 8 32.1	10.466	14	14 51 15.08	2.3465	18 20 15.8	7.206
15	13 7 38.22	2.0752	11 18 50.3	10.424	15	14 53 36.06	2.3528	18 27 19.3	7.108
16	13 9 42.87	2.0800	11 29 17.9	10.382	16	14 55 57.42	2.3592	18 34 16.8	7.008
17	13 11 47.82	2.0849	11 39 36.8	10.338	17	14 58 19.16	2.3655	18 41 8.2	6.907
18	13 13 53.06	2.0899	12 0 6.6	10.293	18	15 0 41.28	2.3718	18 47 53.5	6.806
19	13 15 58.60	2.0948	12 10 17.3	10.248	19	15 3 3.78	2.3782	18 54 32.5	6.703
20	13 18 4.43	2.0998	12 20 25.1	10.202	20	15 5 26.66	2.3844	19 1 5.2	6.606
21	13 20 10.57	2.1049	12 30 30.0	10.154	21	15 7 49.91	2.3907	19 7 31.5	6.502
22	13 22 17.02	2.1100	12 40 31.8	10.106	22	15 10 13.54	2.3969	19 13 51.3	6.398
23	13 24 23.77	2.1152	12 50 30.6	10.058	23	15 12 37.54	2.4032	19 20 4.6	6.296
24	13 26 30.84	2.1204		10.005	24	15 15 1.92	2.4094		6.197
	13 28 38.22	2.1257		9.954		15 17 26.67	2.4156		6.096

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 25.					MONDAY 27.				
0	15 17 26.67	2.4166	S. 19° 26' 11.3	6.066	0	17 19 33.73	2.6418	S. 21° 46' 33.5	0.584
1	15 19 51.79	2.4218	19 32 11.3	6.944	1	17 22 12.31	2.6442	21 45 53.7	0.749
2	15 22 17.29	2.4290	19 38 4.5	6.929	2	17 24 51.03	2.6463	21 45 4.5	0.909
3	15 24 43.15	2.4341	19 43 50.8	6.714	3	17 27 29.87	2.6483	21 44 5.8	1.068
4	15 27 9.38	2.4403	19 49 30.2	6.508	4	17 30 8.83	2.6502	21 42 57.5	1.218
5	15 29 35.98	2.4463	19 55 2.6	6.481	5	17 32 47.90	2.6521	21 41 39.7	1.377
6	15 32 2.94	2.4523	20 0 27.9	6.362	6	17 35 27.08	2.6538	21 40 12.3	1.536
7	15 34 30.26	2.4582	20 5 46.0	6.242	7	17 38 6.36	2.6554	21 38 35.4	1.696
8	15 36 57.93	2.4642	20 10 56.9	6.121	8	17 40 45.73	2.6568	21 36 48.9	1.854
9	15 39 25.96	2.4701	20 16 0.5	6.008	9	17 43 25.18	2.6582	21 34 52.9	2.014
10	15 41 54.34	2.4760	20 20 56.7	6.874	10	17 46 4.71	2.6598	21 32 47.2	2.174
11	15 44 23.08	2.4818	20 25 45.4	6.749	11	17 48 44.30	2.6603	21 30 32.0	2.333
12	15 46 52.16	2.4875	20 30 26.6	6.623	12	17 51 23.95	2.6612	21 28 7.2	2.498
13	15 49 21.58	2.4932	20 35 0.2	6.496	13	17 54 3.65	2.6621	21 25 32.8	2.658
14	15 51 51.35	2.4989	20 39 26.1	6.368	14	17 56 43.40	2.6626	21 22 48.8	2.813
15	15 54 21.45	2.5046	20 43 44.3	6.237	15	17 59 23.18	2.6633	21 19 55.2	2.972
16	15 56 51.89	2.5101	20 47 54.6	6.106	16	18 2 2.99	2.6637	21 16 52.1	3.131
17	15 59 22.66	2.5156	20 51 57.1	5.975	17	18 4 42.82	2.6639	21 13 39.4	3.291
18	16 1 53.76	2.5210	20 55 51.6	5.843	18	18 7 22.66	2.6641	21 10 17.2	3.450
19	16 4 25.18	2.5263	20 59 38.1	5.707	19	18 10 2.51	2.6641	21 6 45.4	3.609
20	16 6 56.91	2.5316	21 3 16.5	5.572	20	18 12 42.35	2.6639	21 3 4.1	3.766
21	16 9 28.96	2.5367	21 6 46.8	5.436	21	18 15 22.18	2.6637	20 59 13.3	3.926
22	16 12 1.32	2.5418	21 10 8.8	5.298	22	18 18 1.99	2.6633	20 55 13.0	4.083
23	16 14 33.98	2.5468	S. 21 13 22.6	5.160	23	18 20 41.78	2.6628	S. 20 51 3.3	4.240
SUNDAY 26.					TUESDAY 28.				
0	16 17 6.94	2.5518	S. 21 16 28.0	5.020	0	18 23 21.53	2.6622	S. 20 46 44.2	4.297
1	16 19 40.20	2.5567	21 19 25.0	4.880	1	18 26 1.24	2.6614	20 42 15.6	4.454
2	16 22 13.75	2.5616	21 22 13.6	4.738	2	18 28 40.90	2.6605	20 37 37.7	4.609
3	16 24 47.59	2.5663	21 24 53.6	4.595	3	18 31 20.50	2.6594	20 32 50.5	4.764
4	16 27 21.71	2.5709	21 27 25.0	4.452	4	18 34 0.03	2.6583	20 27 54.0	4.919
5	16 29 56.10	2.5754	21 29 47.8	4.307	5	18 36 39.50	2.6572	20 22 48.2	5.073
6	16 32 30.76	2.5799	21 32 1.9	4.162	6	18 39 18.89	2.6560	20 17 33.2	5.227
7	16 35 5.69	2.5843	21 34 7.3	4.016	7	18 41 58.19	2.6548	20 12 9.0	5.379
8	16 37 40.87	2.5885	21 36 3.8	3.868	8	18 44 37.40	2.6527	20 6 35.7	5.531
9	16 40 16.30	2.5926	21 37 51.5	3.721	9	18 47 16.51	2.6510	20 0 53.3	5.682
10	16 42 51.98	2.5967	21 39 30.3	3.572	10	18 49 55.52	2.6492	19 55 1.8	5.833
11	16 45 27.90	2.6007	21 41 0.1	3.422	11	18 52 34.41	2.6472	19 49 1.3	5.982
12	16 48 4.06	2.6046	21 42 20.9	3.271	12	18 55 13.18	2.6452	19 42 51.9	6.131
13	16 50 40.44	2.6082	21 43 32.6	3.120	13	18 57 51.83	2.6430	19 36 33.6	6.279
14	16 53 17.04	2.6118	21 44 35.3	2.968	14	19 0 30.34	2.6407	19 30 6.4	6.427
15	16 55 53.86	2.6154	21 45 28.8	2.816	15	19 3 8.71	2.6383	19 23 30.4	6.573
16	16 58 30.89	2.6188	21 46 13.2	2.663	16	19 5 46.94	2.6360	19 16 45.7	6.717
17	17 1 8.12	2.6221	21 46 48.3	2.508	17	19 8 25.02	2.6333	19 9 52.4	6.860
18	17 3 45.54	2.6252	21 47 14.2	2.354	18	19 11 2.94	2.6307	19 2 50.5	7.002
19	17 6 23.15	2.6282	21 47 30.8	2.199	19	19 13 40.70	2.6279	18 55 40.0	7.146
20	17 9 0.93	2.6312	21 47 38.1	2.044	20	19 16 18.29	2.6251	18 48 21.1	7.288
21	17 11 38.89	2.6341	21 47 36.1	1.889	21	19 18 55.71	2.6221	18 40 53.8	7.434
22	17 14 17.02	2.6368	21 47 24.7	1.733	22	19 21 32.94	2.6190	18 33 18.2	7.582
23	17 16 55.30	2.6393	21 47 3.8	1.577	23	19 24 9.99	2.6156	18 25 34.4	7.730
24	17 19 33.73	2.6418	S. 21 46 33.5	1.420	24	19 26 46.85	2.6126	S. 18 17 42.4	7.884

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 29.					FRIDAY 31.				
0	19 26 46.85	2.6126	S. 18° 17' 42.4	7.934	0	21 27 24.88	2.4080	S. 9° 49' 26.6	12.501
1	19 29 23.51	2.6093	18 9 42.3	8.069	1	21 29 48.92	2.3983	9 36 49.5	12.646
2	19 31 59.97	2.6060	18 1 34.1	8.203	2	21 32 12.68	2.3887	9 24 9.2	12.697
3	19 34 36.22	2.6028	17 53 18.0	8.334	3	21 34 36.17	2.3802	9 11 25.8	12.748
4	19 37 12.27	2.5990	17 44 54.0	8.464	4	21 36 59.38	2.3646	8 58 39.4	12.797
5	19 39 48.10	2.5954	17 36 22.3	8.593	5	21 39 22.32	2.3501	8 45 50.2	12.844
6	19 42 23.72	2.5917	17 27 42.9	8.720	6	21 41 44.99	2.3766	8 32 58.2	12.888
7	19 44 59.11	2.5879	17 18 55.9	8.847	7	21 44 7.39	2.3711	8 20 3.6	12.931
8	19 47 34.27	2.5841	17 10 1.3	8.973	8	21 46 29.52	2.3666	8 7 6.5	12.973
9	19 50 9.20	2.5803	17 0 59.3	9.096	9	21 48 51.38	2.3622	7 54 7.0	13.012
10	19 52 43.90	2.5763	16 51 49.9	9.217	10	21 51 12.98	2.3578	7 41 5.1	13.050
11	19 55 18.36	2.5723	16 42 33.3	9.337	11	21 53 34.32	2.3536	7 28 1.0	13.086
12	19 57 52.57	2.5683	16 33 9.5	9.456	12	21 55 55.40	2.3492	7 14 54.8	13.120
13	20 0 26.54	2.5641	16 23 38.6	9.573	13	21 58 16.22	2.3448	7 1 46.6	13.152
14	20 3 0.26	2.5600	16 14 0.7	9.688	14	22 0 36.78	2.3406	6 48 36.5	13.183
15	20 5 33.73	2.5557	16 4 16.0	9.802	15	22 2 57.09	2.3363	6 35 24.6	13.212
16	20 8 6.94	2.5514	15 54 24.5	9.914	16	22 5 17.14	2.3321	6 22 11.0	13.240
17	20 10 39.90	2.5473	15 44 26.3	10.026	17	22 7 36.94	2.3280	6 8 55.8	13.266
18	20 13 12.60	2.5428	15 34 21.5	10.134	18	22 9 56.50	2.3239	5 55 39.1	13.290
19	20 15 45.03	2.5383	15 24 10.2	10.242	19	22 12 15.81	2.3198	5 42 21.0	13.312
20	20 18 17.20	2.5339	15 13 52.5	10.348	20	22 14 34.88	2.3156	5 29 1.7	13.332
21	20 20 49.10	2.5294	15 3 28.5	10.452	21	22 16 53.71	2.3118	5 15 41.2	13.352
22	20 23 20.73	2.5249	14 52 58.3	10.554	22	22 19 12.30	2.3078	5 2 19.5	13.370
23	20 25 52.09	2.5204	S. 14° 42' 22.0	10.654	23	22 21 30.65	2.3039	S. 4° 48' 56.9	13.386
THURSDAY 30.					SATURDAY, AUGUST 1.				
0	20 28 23.18	2.5169	S. 14 31 39.8	10.752	0	22 23 48.77	2.3001	S. 4 35 33.3	13.399
1	20 30 53.99	2.5113	14 20 51.7	10.850					
2	20 33 24.52	2.5066	14 9 57.8	10.946					
3	20 35 54.78	2.5020	13 58 58.2	11.039					
4	20 38 24.76	2.4973	13 47 53.1	11.131					
5	20 40 54.46	2.4927	13 36 42.5	11.223					
6	20 43 23.88	2.4879	13 25 26.5	11.310					
7	20 45 53.01	2.4833	13 14 5.3	11.396					
8	20 48 21.86	2.4786	13 2 39.0	11.481					
9	20 50 50.43	2.4737	12 51 7.6	11.564					
10	20 53 18.71	2.4690	12 39 31.3	11.646					
11	20 55 46.71	2.4643	12 27 50.1	11.726					
12	20 58 14.43	2.4596	12 16 4.3	11.802					
13	21 0 41.86	2.4548	12 4 13.9	11.878					
14	21 3 9.00	2.4500	11 52 18.9	11.952					
15	21 5 35.86	2.4453	11 40 19.6	12.024					
16	21 8 2.44	2.4406	11 28 16.0	12.095					
17	21 10 28.73	2.4358	11 16 8.2	12.163					
18	21 12 54.74	2.4312	11 3 56.4	12.229					
19	21 15 20.47	2.4264	10 51 40.7	12.294					
20	21 17 45.91	2.4217	10 39 21.1	12.357					
21	21 20 11.07	2.4170	10 26 57.8	12.418					
22	21 22 35.95	2.4124	10 14 30.9	12.478					
23	21 25 0.56	2.4077	10 2 0.4	12.536					
24	21 27 24.88	2.4030	S. 9° 49' 26.6	12.591					

PHASES OF THE MOON.

☾ Last Quarter, . . .	d	h	m
● New Moon, . . .	7	10	29.0
☾ First Quarter, . . .	15	10	53.3
☾ Full Moon, . . .	23	9	32.4
	30	1	33.8

☾ Perigee,	d	h
☾ Apogee,	1	3.5
☾ Perigee,	15	6.0
	29	13.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	Jupiter W.	84° 16' 53"	1998	86° 10' 31"	1998	88° 4' 8"	1999	89° 57' 44"	2000
	Spica W.	80 23 47	1997	82 18 13	1997	84 12 39	1998	86 7 3	1970
	Antares W.	35 8 36	2007	37 1 59	2003	38 55 28	2001	40 49 0	2000
	Fomalhaut E.	54 20 19	2761	52 44 47	2793	51 10 10	2839	49 36 33	2892
	α Pegasi E.	69 33 30	2126	67 43 10	2130	65 52 57	2136	64 2 52	2143
	α Arietis E.	112 34 1	2007	110 40 37	2006	108 47 12	2006	106 53 46	2006
2	Jupiter W.	99 24 42	2021	101 17 44	2026	103 10 37	2034	105 3 18	2042
	Spica W.	95 38 2	1999	97 31 53	1998	99 25 34	2003	101 19 4	2010
	Antares W.	50 16 29	2011	52 9 46	2016	54 2 55	2023	55 55 54	2030
	Fomalhaut E.	42 8 16	2290	40 43 41	2391	39 21 14	2517	38 1 9	2692
	α Pegasi E.	54 56 1	2203	53 7 38	2220	51 19 40	2239	49 32 11	2260
	α Arietis E.	97 27 22	2023	95 34 24	2030	93 41 36	2036	91 48 58	2044
3	Antares W.	65 17 50	2073	67 9 30	2086	69 0 52	2096	70 51 57	2109
	α Pegasi E.	40 43 54	2410	39 0 34	2461	37 18 12	2498	35 36 56	2550
	α Arietis E.	82 29 7	2092	80 37 56	2104	78 47 3	2117	76 56 30	2130
	Aldebaran E.	115 35 47	2070	113 44 16	2090	111 53 2	2102	110 2 6	2113
4	Antares W.	80 2 26	2177	81 51 28	2192	83 40 8	2208	85 28 24	2223
	α Aquilæ W.	35 32 12	2740	36 48 17	2826	38 6 24	2896	39 26 19	2943
	α Arietis E.	67 49 0	2204	66 0 38	2220	64 12 41	2237	62 25 9	2256
	Aldebaran E.	100 52 13	2182	99 3 18	2196	97 14 45	2212	95 26 35	2226
	SUN E.	134 18 39	2465	132 36 37	2482	130 54 58	2498	129 13 42	2514
5	Antares W.	94 23 45	2307	96 9 35	2324	97 55 0	2343	99 39 59	2360
	α Aquilæ W.	46 25 32	3177	47 52 9	3146	49 19 23	3119	50 47 9	3096
	α Arietis E.	53 34 5	2246	51 49 15	2269	50 4 54	2289	48 21 3	2410
	Aldebaran E.	86 31 47	2311	84 46 3	2328	83 0 45	2346	81 15 52	2363
	SUN E.	120 53 14	2602	119 14 22	2620	117 35 54	2636	115 57 51	2657
6	α Aquilæ W.	58 11 3	3043	59 40 24	3038	61 9 50	3036	62 39 18	3037
	Fomalhaut W.	35 2 46	4311	36 9 28	4179	37 18 14	4063	38 28 52	3992
	α Arietis E.	39 49 27	2922	38 8 44	2946	36 28 35	2973	34 49 1	2999
	Aldebaran E.	72 37 47	2453	70 55 27	2470	69 13 32	2486	67 32 2	2506
	SUN E.	107 53 55	2761	106 18 23	2769	104 43 15	2786	103 8 32	2806
7	α Aquilæ W.	70 5 55	3057	71 34 57	3066	73 3 50	3073	74 32 33	3082
	Fomalhaut W.	44 43 4	3634	46 1 2	3692	47 19 45	3666	48 39 7	3626
	Aldebaran E.	59 10 45	2696	57 31 43	2612	55 53 5	2629	54 14 50	2647
	SUN E.	95 20 59	2890	93 48 39	2916	92 16 41	2936	90 45 6	2962
8	α Aquilæ W.	81 53 13	3133	83 20 42	3145	84 47 57	3168	86 14 57	3170
	Fomalhaut W.	55 23 10	3424	56 44 59	3413	58 7 1	3403	59 29 15	3394
	α Pegasi W.	34 7 5	3161	35 34 13	3131	37 1 45	3113	38 29 36	3108
	Aldebaran E.	46 9 25	2732	44 33 28	2749	42 57 53	2766	41 22 40	2763
	SUN E.	83 12 34	3036	81 43 6	3052	80 13 57	3069	78 45 8	3093
9	α Aquilæ W.	93 26 5	3237	94 51 30	3292	96 16 38	3366	97 41 29	3391
	Fomalhaut W.	66 22 5	3376	67 44 49	3376	69 7 33	3376	70 30 17	3377
	α Pegasi W.	45 51 37	3075	47 20 17	3074	48 48 58	3073	50 17 40	3074
	Aldebaran E.	33 32 10	2869	31 59 11	2897	30 26 36	2906	28 54 25	2896
	SUN E.	71 25 36	3166	69 58 34	3169	68 31 48	3182	67 5 17	3196
10	α Aquilæ W.	104 41 16	3361	106 4 17	3378	107 26 59	3396	108 49 21	3414

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XV ^h .	P. L. of Dist.	XVIII ^h .	P. L. of Dist.	XXI ^h .	P. L. of Dist.
1	Jupiter W.	91° 51' 18"	2008	93° 44' 48"	2006	95° 38' 18"	2010	97° 31' 31"	2016
	Spica W.	88 1 25	1973	89 55 43	1976	91 49 56	1979	93 44 3	1984
	Antares W.	42 42 34	2001	44 36 7	2002	46 29 38	2004	48 23 6	2007
	Fomalhaut E.	48 4 4	2062	46 32 51	2019	45 3 2	2096	43 34 47	2182
	α Pegasi E.	62 12 59	2162	60 23 19	2163	58 33 54	2174	56 44 47	2188
	α Arietis E.	105 0 21	2006	103 6 59	2010	101 13 41	2014	99 20 28	2018
2	Jupiter W.	106 55 46	2062	108 48 0	2062	110 39 58	2073	112 31 39	2086
	Spica W.	103 12 22	2019	105 5 27	2028	106 58 18	2037	108 50 54	2048
	Antares W.	57 48 42	2067	59 41 19	2046	61 33 43	2063	63 25 54	2063
	Fomalhaut E.	36 43 41	2027	35 29 7	4017	34 17 44	4226	33 9 52	4480
	α Pegasi E.	47 45 13	2266	45 58 50	2311	44 13 7	2341	42 28 7	2373
	α Arietis E.	89 56 32	2062	88 4 19	2061	86 12 19	2071	84 20 35	2081
3	Antares W.	72 42 43	2121	74 33 10	2135	76 23 16	2148	78 13 2	2163
	α Pegasi E.	33 56 52	2609	32 18 9	2677	30 40 58	2766	29 5 31	2846
	α Arietis E.	75 6 17	2143	73 16 24	2168	71 26 53	2173	69 37 45	2186
	Aldebaran E.	108 11 27	2126	106 21 7	2130	104 31 8	2163	102 41 30	2167
4	Antares W.	87 16 17	2226	89 3 46	2266	90 50 50	2272	92 37 30	2260
	α Aquilæ W.	40 47 48	2370	42 10 39	2310	43 34 39	2329	44 59 39	2314
	α Arietis E.	60 38 3	2272	58 51 23	2290	57 5 9	2269	55 19 23	2238
	Aldebaran E.	93 38 49	2344	91 51 27	2260	90 4 29	2277	88 17 56	2294
	SUN E.	127 32 48	2331	125 52 18	2649	124 12 13	2666	122 32 31	2684
5	Antares W.	101 24 33	2376	103 8 42	2394	104 52 25	2412	106 35 43	2430
	α Aquilæ W.	52 15 21	2691	53 43 54	2666	55 12 45	2666	56 41 49	2647
	α Arietis E.	46 37 42	2431	44 54 51	2453	43 12 31	2476	41 30 43	2496
	Aldebaran E.	79 31 24	2381	77 47 22	2398	76 3 45	2416	74 20 33	2434
	SUN E.	114 20 14	2676	112 43 2	2694	111 6 14	2713	109 29 52	2732
6	α Aquilæ W.	64 8 45	2639	65 38 9	2642	67 7 30	2646	68 36 46	2652
	Fomalhaut W.	39 41 9	2676	40 54 53	2603	42 9 52	2739	43 25 58	2692
	α Arietis E.	33 10 4	2627	31 31 46	2667	29 54 9	2689	28 17 14	2722
	Aldebaran E.	65 50 57	2624	64 10 17	2642	62 30 2	2660	60 50 11	2677
	SUN E.	101 34 14	2626	100 0 20	2644	98 26 49	2662	96 53 42	2681
7	α Aquilæ W.	76 1 5	2691	77 29 26	2101	78 57 34	2111	80 25 30	2122
	Fomalhaut W.	49 59 4	2497	51 19 31	2476	52 40 23	2466	54 1 37	2438
	Aldebaran E.	52 36 59	2664	50 59 31	2681	49 22 26	2698	47 45 44	2716
	SUN E.	89 13 53	2969	87 43 1	2966	86 12 31	3003	84 42 22	3020
8	α Aquilæ W.	87 41 42	2163	89 8 12	2197	90 34 25	2209	92 0 23	2228
	Fomalhaut W.	60 51 38	2366	62 14 8	2364	63 36 43	2379	64 59 23	2378
	α Pegasi W.	39 57 42	2693	41 26 0	2687	42 54 26	2681	44 22 59	2677
	Aldebaran E.	39 47 50	2799	38 13 21	2817	36 39 15	2834	35 5 31	2862
	SUN E.	77 16 38	2698	75 48 26	2113	74 20 32	2127	72 52 55	2142
9	α Aquilæ W.	99 6 3	2296	100 30 19	2312	101 54 17	2328	103 17 56	2346
	Fomalhaut W.	71 53 0	2379	73 15 41	2381	74 38 19	2386	76 0 53	2388
	α Pegasi W.	51 46 21	2676	53 15 0	2678	54 43 36	2691	56 12 9	2684
	Aldebaran E.	27 22 39	2946	25 51 19	2960	24 20 28	2993	22 50 7	3019
	SUN E.	65 39 2	2208	64 13 2	2220	62 47 16	2232	61 21 45	2243
10	α Aquilæ W.	110 11 22	2432	111 33 2	2461	112 54 21	2471	114 15 17	2492

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dif.	III ^h .	P. L. of Dif.	VI ^h .	P. L. of Dif.	IX ^h .	P. L. of Dif.
10	Fomalhaut W.	77° 23' 23"	3392	78° 45' 49"	3395	80° 8' 10"	3401	81° 30' 25"	3407
	α Pegasi W.	57 40 38	3097	59 9 3	3091	60 37 23	3095	62 5 39	3099
	SUN E.	59 56 27	3265	58 31 23	3266	57 6 32	3276	55 41 53	3268
11	Fomalhaut W.	88 20 5	3438	89 41 39	3444	91 3 6	3452	92 24 24	3460
	α Pegasi W.	69 25 41	3121	70 53 25	3126	72 21 4	3129	73 48 38	3134
	α Arietis W.	25 48 49	3146	27 16 3	3136	28 43 29	3128	30 11 5	3121
	SUN E.	48 41 34	3325	47 18 3	3344	45 54 42	3351	44 31 30	3360
12	Fomalhaut W.	99 8 38	3503	100 28 59	3513	101 49 9	3523	103 9 8	3534
	α Pegasi W.	81 5 7	3156	82 32 9	3160	83 59 6	3164	85 25 58	3168
	α Arietis W.	37 30 28	3108	38 58 28	3106	40 26 30	3106	41 54 32	3106
	SUN E.	37 37 50	3399	36 15 32	3405	34 53 22	3414	33 31 21	3421
17	SUN W.	17 28 33	3515	18 48 39	3400	20 9 3	3488	21 29 41	3476
	Saturn E.	49 42 48	3138	48 15 24	3138	46 48 0	3138	45 20 36	3138
	Jupiter E.	67 58 27	3107	66 30 26	3105	65 2 23	3103	63 34 17	3100
	Spica E.	70 37 38	3056	69 8 35	3054	67 39 29	3051	66 10 19	3047
18	SUN W.	28 15 48	3429	29 37 32	3421	30 59 25	3413	32 21 27	3405
	Saturn E.	38 3 40	3142	36 36 21	3143	35 9 4	3145	33 41 49	3148
	Jupiter E.	56 12 54	3085	54 44 26	3092	53 15 54	3078	51 47 17	3073
	Spica E.	58 43 26	3029	57 13 49	3025	55 44 7	3020	54 14 19	3015
	Antares E.	104 11 24	3043	102 42 4	3038	101 12 38	3033	99 43 6	3028
19	SUN W.	39 13 47	3365	40 36 42	3355	41 59 46	3350	43 23 0	3341
	Jupiter E.	44 22 58	3063	42 53 51	3048	41 24 38	3044	39 55 20	3039
	Spica E.	46 43 43	2988	45 13 15	2981	43 42 39	2974	42 11 54	2968
	Antares E.	92 13 48	3000	90 43 35	2993	89 13 14	2986	87 42 44	2980
20	SUN W.	50 21 42	3295	51 45 59	3285	53 10 27	3276	54 35 7	3265
	Regulus W.	20 11 40	3089	21 40 3	3061	23 9 0	3034	24 38 30	3011
	Jupiter E.	32 27 27	3018	30 57 37	3015	29 27 43	3013	27 57 46	3010
	Spica E.	34 35 58	2931	33 4 18	2922	31 32 27	2914	30 0 26	2906
	Antares E.	80 7 59	2941	78 36 32	2932	77 4 54	2924	75 33 6	2915
21	SUN W.	61 41 40	3309	63 7 39	3196	64 33 53	3183	66 0 22	3170
	Regulus W.	32 12 32	2917	33 44 29	2901	35 16 47	2885	36 49 25	2869
	Venus W.	16 38 9	3407	18 0 18	3364	19 23 16	3326	20 46 57	3292
	Antares E.	67 51 6	2966	66 18 3	2955	64 44 47	2945	63 11 17	2933
	α Aquilæ E.	118 23 52	3415	117 1 53	3398	115 39 23	3363	114 16 24	3336
22	SUN W.	73 16 45	3192	74 44 52	3087	76 13 17	3072	77 42 1	3057
	Regulus W.	44 37 38	2792	46 12 17	2775	47 47 17	2760	49 22 37	2744
	Venus W.	27 53 56	3165	29 20 47	3143	30 48 4	3121	32 15 48	3101
	Antares E.	55 20 1	2774	53 44 59	2761	52 9 40	2749	50 34 5	2736
	α Aquilæ E.	107 14 34	3224	105 48 53	3204	104 22 48	3183	102 56 19	3163
23	SUN W.	85 10 25	2977	86 41 6	2961	88 12 8	2944	89 43 31	2927
	Regulus W.	57 24 32	2964	59 2 0	2947	60 39 51	2931	62 18 4	2915
	Venus W.	39 40 41	3001	41 10 53	2981	42 41 30	2962	44 12 31	2941
	Saturn W.	24 55 45	2836	26 29 26	2801	28 3 52	2770	29 38 59	2741
	Antares E.	42 31 50	2670	40 54 30	2657	39 16 52	2644	37 38 57	2631
	α Aquilæ E.	95 38 4	3070	94 9 18	3053	92 40 11	3036	91 10 43	3020

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
10	Fomalhaut W.	82° 52' 34"	3413	84° 14' 37"	3417	85° 36' 34"	3424	86° 58' 23"	3431
	α Pegasi W.	63° 33' 50	3103	65° 1' 56	3108	66° 29' 56	3112	67° 57' 51	3116
	Sun E.	54 17 27	3297	52 53 12	3306	51 29 8	3317	50 5 16	3326
11	Fomalhaut W.	93 45 33	3468	95 6 33	3478	96 27 24	3484	97 48 6	3493
	α Pegasi W.	75 16 6	3138	76 43 29	3143	78 10 47	3147	79 38 0	3152
	α Arietis W.	31 38 49	3116	33 6 39	3114	34 34 32	3110	36 2 29	3109
	Sun E.	43 8 28	3308	41 45 35	3376	40 22 51	3384	39 0 16	3392
12	Fomalhaut W.	104 28 55	3546	105 48 29	3567	107 7 50	3569	108 26 58	3582
	α Pegasi W.	86 52 46	3173	88 19 29	3176	89 46 7	3179	91 12 41	3183
	α Arietis W.	43 22 34	3106	44 50 36	3105	46 18 38	3107	47 46 39	3108
	Sun E.	32 9 28	3428	30 47 43	3435	29 26 6	3443	28 4 38	3450
17	Sun W.	22 50 32	3465	24 11 35	3468	25 32 49	3446	26 54 14	3438
	Saturn E.	43 53 12	3138	42 25 48	3138	40 58 24	3138	39 31 1	3140
	Jupiter E.	62 6 7	3097	60 37 54	3096	59 9 38	3091	57 41 18	3088
	Spica E.	64 41 5	3044	63 11 47	3041	61 42 25	3037	60 12 58	3033
18	Sun W.	33 43 37	3398	35 5 56	3390	36 28 24	3382	37 51 1	3374
	Saturn E.	32 14 38	3163	30 47 33	3168	29 20 34	3165	27 53 43	3173
	Jupiter E.	50 18 35	3070	48 49 49	3065	47 20 57	3061	45 52 0	3057
	Spica E.	52 44 25	3010	51 14 25	3003	49 44 18	2999	48 14 4	2993
	Antares E.	98 13 28	3022	96 43 43	3018	95 13 52	3012	93 43 54	3006
19	Sun W.	44 46 24	3332	46 9 58	3324	47 33 42	3314	48 57 37	3306
	Jupiter E.	38 25 56	3035	36 56 27	3030	35 26 52	3026	33 57 12	3023
	Spica E.	40 41 1	2961	39 9 59	2964	37 38 48	2946	36 7 28	2939
	Antares E.	86 12 6	2973	84 41 19	2965	83 10 22	2966	81 39 16	2949
20	Sun W.	56 0 0	3264	57 25 5	3243	58 50 23	3231	60 15 55	3220
	Regulus W.	26 8 29	2990	27 38 54	2989	29 9 43	2951	30 40 57	2955
	Jupiter E.	26 27 46	3000	24 57 45	3010	23 27 45	3013	21 57 48	3017
	Spica E.	28 28 13	2906	26 55 49	2967	25 23 13	2978	23 50 26	2968
	Antares E.	74 1 6	2906	72 28 55	2906	70 56 31	2967	69 23 55	2976
21	Sun W.	67 27 7	3168	68 54 7	3144	70 21 23	3131	71 48 55	3116
	Regulus W.	38 22 23	2964	39 55 41	2988	41 29 20	2922	43 3 19	2907
	Venus W.	22 11 17	3264	23 36 11	3237	25 1 36	3211	26 27 32	3188
	Antares E.	61 37 32	2921	60 3 32	2910	58 29 17	2798	56 54 47	2786
	α Aquilæ E.	112 52 56	3214	111 29 1	3200	110 4 38	3208	108 39 49	3246
22	Sun W.	79 11 3	3042	80 40 24	3026	82 10 5	3010	83 40 5	2994
	Regulus W.	50 58 18	2729	52 34 19	2713	54 10 42	2697	55 47 26	2681
	Venus W.	33 43 57	3080	35 12 31	3060	36 41 30	3040	38 10 53	3020
	Antares E.	48 58 13	2723	47 22 4	2710	45 45 37	2696	44 8 52	2684
	α Aquilæ E.	101 29 26	3144	100 2 10	3124	98 34 30	3106	97 6 28	3088
23	Sun W.	91 15 16	2908	92 47 23	2892	94 19 52	2874	95 52 44	2857
	Regulus W.	63 56 39	2898	65 35 37	2880	67 14 59	2864	68 54 44	2846
	Venus W.	45 43 58	2922	47 15 49	2901	48 48 6	2892	50 20 48	2862
	Saturn W.	31 14 44	2713	32 51 6	2687	34 28 3	2669	36 5 34	2638
	Antares E.	36 0 44	2618	34 22 14	2606	32 43 27	2595	31 4 25	2583
	α Aquilæ E.	89 40 55	3004	88 10 47	2988	86 40 19	2973	85 9 32	2958

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
24	SUN W.	97° 25' 58"	2836	98° 59' 36"	2821	100° 33' 37"	2802	102° 8' 2"	2784
	Regulus W.	70 34 53	2829	72 15 26	2812	73 56 22	2494	75 37 43	2477
	Venus W.	51 53 55	2842	53 27 28	2823	55 1 26	2803	56 35 50	2784
	Saturn W.	37 43 37	2615	39 22 11	2602	41 1 17	2570	42 40 53	2548
	Jupiter W.	19 5 44	2682	20 42 48	2644	22 20 43	2610	23 59 24	2580
	Spica W.	16 31 32	2622	18 12 14	2603	19 53 23	2484	21 34 59	2465
	Antares E.	29 25 7	2673	27 45 35	2664	26 5 50	2656	24 25 55	2651
	α Aquilæ E.	83 38 27	2845	82 7 5	2831	80 35 26	2919	79 3 31	2907
25	SUN W.	110 6 6	2693	111 42 55	2675	113 20 8	2657	114 57 46	2640
	Regulus W.	84 10 39	2389	85 54 29	2373	87 38 43	2355	89 23 22	2339
	Venus W.	64 34 18	2688	66 11 18	2666	67 48 44	2646	69 26 36	2627
	Saturn W.	51 6 12	2446	52 48 41	2426	54 31 38	2408	56 15 2	2388
	Jupiter W.	32 22 15	2407	34 4 29	2435	35 47 14	2414	37 30 29	2394
	Spica W.	30 9 28	2375	31 53 39	2367	33 38 16	2339	35 23 18	2322
	α Aquilæ E.	71 20 29	2861	69 47 20	2855	68 14 3	2849	66 40 39	2846
	Fomalhaut E.	98 45 12	2861	97 11 50	2831	95 38 2	2811	94 3 48	2792
26	SUN W.	123 11 50	2563	124 51 49	2538	126 32 10	2521	128 12 54	2505
	Venus W.	77 42 23	2635	79 22 48	2617	81 3 38	2499	82 44 52	2482
	Saturn W.	64 58 46	2398	66 44 48	2381	68 31 16	2364	70 18 9	2346
	Jupiter W.	46 13 51	2398	47 59 53	2381	49 46 21	2363	51 33 15	2347
	Spica W.	44 14 44	2327	46 2 16	2321	47 50 12	2306	49 38 31	2190
	α Aquilæ E.	58 53 25	2659	57 20 13	2609	55 47 14	2582	54 14 32	2568
	Fomalhaut E.	86 6 45	2710	84 30 18	2697	82 53 34	2686	81 16 34	2674
27	Venus W.	91 16 58	2402	93 0 30	2388	94 44 22	2374	96 28 34	2361
	Saturn W.	79 18 20	2173	81 7 28	2160	82 56 57	2146	84 46 46	2134
	Jupiter W.	60 33 42	2170	62 22 55	2156	64 12 29	2143	66 2 23	2130
	Spica W.	58 45 47	2118	60 36 19	2105	62 27 11	2092	64 18 23	2080
	α Aquilæ E.	46 38 0	2050	45 8 49	2039	43 40 38	2137	42 13 37	2325
	Fomalhaut E.	73 8 31	2641	71 30 32	2630	69 52 30	2640	68 14 29	2643
	α Pegasi E.	90 28 25	2266	88 41 21	2242	86 53 58	2222	85 6 18	2220
28	Jupiter W.	75 16 24	2076	77 8 0	2067	78 59 50	2060	80 51 52	2052
	Spica W.	73 38 46	2027	75 31 38	2019	77 24 43	2011	79 18 0	2003
	Antares W.	28 28 50	2089	30 20 6	2074	32 11 45	2061	34 3 45	2048
	Fomalhaut E.	60 6 13	2680	58 29 20	2710	56 52 53	2732	55 16 55	2750
	α Pegasi E.	76 4 9	2177	74 15 7	2173	72 25 57	2167	70 36 40	2163
29	Jupiter W.	90 14 33	2026	92 7 27	2023	94 0 25	2021	95 53 26	2020
	Spica W.	88 46 55	1978	90 41 4	1975	92 35 17	1974	94 29 33	1972
	Antares W.	43 27 46	2008	45 21 8	2003	47 14 37	1999	49 8 13	1996
	Fomalhaut E.	47 28 0	2672	45 57 12	2686	44 27 44	2109	42 59 45	2198
	α Pegasi E.	61 29 30	2165	59 40 10	2170	57 50 57	2176	56 1 53	2184
	α Arietis E.	104 15 28	2016	102 22 18	2012	100 29 3	2010	98 35 44	2008
30	Antares W.	58 36 48	1998	60 30 28	1999	62 24 4	2003	64 17 34	2007
	α Pegasi E.	47 0 37	2267	45 13 34	2260	43 27 5	2266	41 41 14	2236
	α Arietis E.	89 8 57	2018	87 15 43	2017	85 22 35	2021	83 29 33	2026
31	Antares W.	73 42 58	2041	75 35 28	2050	77 27 44	2060	79 19 45	2070
	α Aquilæ W.	31 34 17	4326	32 42 17	4015	33 53 42	3836	35 8 8	3688
	α Arietis E.	74 6 53	2066	72 15 0	2075	70 23 22	2086	68 32 2	2098
	Aldebaran E.	107 10 31	2044	105 18 5	2053	103 25 53	2062	101 33 56	2072

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
24	SUN W.	103° 42' 51"	2766	105° 18' 4"	2747	106° 53' 41"	2730	108° 29' 41"	2711
	Regulus W.	77 19 29	2489	79 1 40	2443	80 44 15	2424	82 27 15	2408
	Venus W.	58 10 39	2764	59 45 54	2744	61 21 36	2724	62 57 44	2704
	Saturn W.	44 20 59	2627	46 1 34	2607	47 42 38	2486	49 24 11	2466
	Jupiter W.	25 38 46	2653	27 18 46	2627	28 59 22	2602	30 40 32	2479
	Spica W.	23 17 1	2447	24 59 29	2429	26 42 23	2410	28 25 43	2393
	Antares E.	22 45 53	2549	21 5 48	2550	19 25 44	2566	17 45 48	2572
	α Aquilæ E.	77 31 21	2696	75 58 57	2686	74 26 19	2676	72 53 29	2668
25	SUN W.	116 35 47	2622	118 14 12	2604	119 53 1	2587	121 32 14	2570
	Regulus W.	91 8 25	2323	92 53 53	2304	94 39 46	2288	96 26 3	2273
	Venus W.	71 4 54	2608	72 43 38	2589	74 22 48	2571	76 2 23	2553
	Saturn W.	57 58 54	2609	59 43 13	2561	61 27 58	2533	63 13 9	2516
	Jupiter W.	39 14 13	2373	40 58 26	2364	42 43 7	2355	44 28 15	2346
	Spica W.	37 8 45	2306	38 54 37	2287	40 40 55	2271	42 27 37	2254
	α Aquilæ E.	65 7 11	2645	63 33 41	2645	62 0 12	2645	60 26 46	2622
	Fomalhaut E.	92 29 9	2773	90 54 6	2766	89 18 40	2740	87 42 53	2724
26	SUN W.	129 53 59	2491	131 35 25	2476	133 17 12	2462	134 59 18	2449
	Venus W.	84 26 31	2485	86 8 34	2448	87 51 0	2433	89 33 48	2417
	Saturn W.	72 5 25	2323	73 53 5	2316	75 41 8	2302	77 29 33	2287
	Jupiter W.	53 20 33	2230	55 8 16	2214	56 56 22	2199	58 44 51	2184
	Spica W.	51 27 13	2175	53 16 18	2160	55 5 46	2145	56 55 36	2122
	α Aquilæ E.	52 42 10	2618	51 10 14	2643	49 38 50	2673	48 8 3	2608
	Fomalhaut E.	79 39 19	2664	78 1 51	2667	76 24 13	2649	74 46 25	2646
27	Venus W.	98 13 5	2348	99 57 55	2335	101 43 3	2324	103 28 28	2313
	Saturn W.	86 36 53	2122	88 27 18	2111	90 18 0	2101	92 8 58	2092
	Jupiter W.	67 52 36	2118	69 43 8	2107	71 33 57	2096	73 25 3	2086
	Spica W.	66 9 53	2069	68 1 41	2067	69 53 47	2046	71 46 9	2037
	α Aquilæ E.	40 47 58	2305	39 23 52	2307	38 1 32	2306	36 41 14	2304
	Fomalhaut E.	66 36 31	2648	64 58 39	2663	63 20 56	2663	61 43 26	2676
	α Pegasi E.	83 18 21	2310	81 30 8	2300	79 41 41	2192	77 53 1	2184
28	Jupiter W.	82 44 6	2043	84 36 30	2039	86 29 4	2034	88 21 45	2030
	Spica W.	81 11 29	1997	83 5 8	1991	84 58 56	1986	86 52 52	1982
	Antares W.	35 56 4	2037	37 48 40	2028	39 41 30	2020	41 34 33	2014
	Fomalhaut E.	53 41 33	2790	52 6 52	2826	50 32 58	2868	48 50 58	2916
	α Pegasi E.	68 47 17	2161	66 57 51	2160	65 8 23	2160	63 18 55	2162
29	Jupiter W.	97 46 29	2030	99 39 32	2020	101 32 35	2021	103 25 36	2024
	Spica W.	96 23 52	1971	98 18 12	1972	100 12 31	1973	102 6 48	1976
	Antares W.	51 1 53	1994	52 55 36	1993	54 49 21	1994	56 43 5	1994
	Fomalhaut E.	41 33 27	2380	40 9 3	2399	38 46 45	2425	37 26 49	2473
	α Pegasi E.	54 13 1	2194	52 24 24	2206	50 36 6	2220	48 48 9	2237
	α Arietis E.	96 42 22	2007	94 48 59	2007	92 55 36	2009	91 2 15	2010
30	Antares W.	66 10 58	2012	68 4 13	2018	69 57 19	2025	71 50 14	2032
	α Pegasi E.	39 56 7	2371	38 11 50	2410	36 28 29	2455	34 46 13	2507
	α Arietis E.	81 36 39	2032	79 43 55	2039	77 51 22	2047	75 59 1	2056
31	Antares W.	81 11 30	2082	83 2 57	2093	84 54 7	2106	86 44 57	2118
	α Aquilæ W.	36 25 13	2554	37 44 38	2443	39 6 6	2380	40 29 20	2370
	α Arietis E.	66 41 0	2111	64 50 17	2124	62 59 55	2136	61 9 54	2153
	Aldebaran E.	99 42 16	2085	97 50 53	2096	95 59 47	2108	94 9 0	2122

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to subtracted from Apparent Time.	Diff. for 1 hour.	
		Apparent Right Ascension.		Diff. for 1 hour.	Apparent Declination.		Diff. for 1 hour.				Semi-diameter.
		^h ^m ^s	^s		[°] ['] ["]	["] ['] ["]					
Sat.	1	8 44 28.75	9.715	N. 18 6 4.0	37.56	15 48.06	66.68	^m ^s 6 3.75	^s 0.141		
Sun.	2	8 48 21.60	9.690	17 50 53.6	38.29	15 48.19	66.59	6 0.05	0.166		
Mon.	3	8 52 13.85	9.666	17 35 25.8	39.02	15 48.32	66.50	5 55.76	0.190		
Tues.	4	8 56 5.51	9.641	17 19 40.6	39.74	15 48.45	66.42	5 50.88	0.215		
Wed.	5	8 59 56.59	9.617	17 3 38.4	40.44	15 48.59	66.34	5 45.42	0.239		
Thur.	6	9 3 47.09	9.593	16 47 19.4	41.13	15 48.73	66.25	5 39.38	0.263		
Fri.	7	9 7 37.02	9.569	16 30 44.1	41.81	15 48.87	66.16	5 32.76	0.287		
Sat.	8	9 11 26.37	9.545	16 13 52.8	42.47	15 49.01	66.07	5 25.58	0.311		
Sun.	9	9 15 15.15	9.522	15 56 45.7	43.12	15 49.15	65.98	5 17.83	0.334		
Mon.	10	9 19 3.37	9.498	15 39 23.2	43.76	15 49.30	65.90	5 9.51	0.358		
Tues.	11	9 22 51.03	9.475	15 21 45.6	44.38	15 49.46	65.82	5 0.64	0.381		
Wed.	12	9 26 38.13	9.452	15 3 53.2	44.99	15 49.63	65.74	4 51.22	0.404		
Thur.	13	9 30 24.68	9.429	14 45 46.3	45.59	15 49.80	65.66	4 41.24	0.427		
Fri.	14	9 34 10.67	9.406	14 27 25.1	46.17	15 49.98	65.58	4 30.71	0.450		
Sat.	15	9 37 56.12	9.384	14 8 50.2	46.74	15 50.16	65.50	4 19.63	0.472		
Sun.	16	9 41 41.04	9.362	13 50 1.8	47.29	15 50.34	65.42	4 8.02	0.494		
Mon.	17	9 45 25.43	9.340	13 31 0.3	47.83	15 50.53	65.34	3 55.89	0.516		
Tues.	18	9 49 9.30	9.318	13 11 46.1	48.36	15 50.72	65.27	3 43.24	0.538		
Wed.	19	9 52 52.65	9.297	12 52 19.4	48.87	15 50.92	65.20	3 30.08	0.559		
Thur.	20	9 56 35.50	9.276	12 32 40.6	49.37	15 51.12	65.13	3 16.41	0.580		
Fri.	21	10 0 17.85	9.256	12 12 49.8	49.86	15 51.32	65.06	3 2.25	0.600		
Sat.	22	10 3 59.72	9.236	11 52 47.4	50.34	15 51.53	64.99	2 47.60	0.620		
Sun.	23	10 7 41.12	9.217	11 32 33.8	50.80	15 51.74	64.92	2 32.49	0.639		
Mon.	24	10 11 22.06	9.198	11 12 9.4	51.25	15 51.95	64.86	2 16.93	0.658		
Tues.	25	10 15 2.55	9.180	10 51 34.4	51.68	15 52.16	64.80	2 0.91	0.676		
Wed.	26	10 18 42.63	9.163	10 30 49.2	52.10	15 52.38	64.74	1 44.47	0.693		
Thur.	27	10 22 22.29	9.146	10 9 54.0	52.51	15 52.60	64.68	1 27.62	0.709		
Fri.	28	10 26 1.56	9.130	9 48 49.1	52.91	15 52.82	64.63	1 10.39	0.725		
Sat.	29	10 29 40.47	9.115	9 27 34.8	53.30	15 53.04	64.58	0 52.79	0.740		
Sun.	30	10 33 19.03	9.101	9 6 11.3	53.67	15 53.26	64.53	0 34.84	0.754		
Mon.	31	10 36 57.25	9.087	8 44 39.0	54.03	15 53.49	64.48	0 16.56	0.768		
Tues.	32	10 40 35.15	9.075	N. 8 22 58.3	54.37	15 53.72	64.43	0 2.03	0.781		

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sidereal Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from	added to Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.				
		^h ^m ^s	^s	[°] ['] ["]	["]				
Sat.	1	8 44 27.77	9.715	N. 18° 6' 7.8	37.56	^m ^s 6 3.76	^s 0.141	^h ^m ^s 8 38 24.01	
Sun.	2	8 48 20.63	9.690	17 50 57.4	33.29	6 0.06	0.166	8 42 20.57	
Mon.	3	8 52 12.90	9.666	17 35 29.6	33.02	5 55.78	0.190	8 46 17.12	
Tues.	4	8 56 4.58	9.641	17 19 44.4	30.74	5 50.90	0.215	8 50 13.68	
Wed.	5	8 59 55.67	9.617	17 3 42.2	40.44	5 45.44	0.239	8 54 10.23	
Thur.	6	9 3 46.19	9.593	16 47 23.2	41.13	5 39.40	0.263	8 58 6.79	
Fri.	7	9 7 36.14	9.569	16 30 47.9	41.81	5 32.79	0.287	9 2 3.35	
Sat.	8	9 11 25.51	9.545	16 13 56.6	42.47	5 25.61	0.311	9 5 59.90	
Sun.	9	9 15 14.31	9.522	15 56 49.5	43.12	5 17.86	0.334	9 9 56.45	
Mon.	10	9 19 2.55	9.498	15 39 27.0	43.76	5 9.54	0.358	9 13 53.01	
Tues.	11	9 22 50.23	9.475	15 21 49.4	44.38	5 0.67	0.381	9 17 49.56	
Wed.	12	9 26 37.36	9.452	15 3 56.9	44.99	4 51.24	0.404	9 21 46.12	
Thur.	13	9 30 23.94	9.429	14 45 49.9	45.59	4 41.27	0.427	9 25 42.67	
Fri.	14	9 34 9.96	9.406	14 27 23.6	46.17	4 30.74	0.450	9 29 39.22	
Sat.	15	9 37 55.44	9.384	14 8 53.6	46.74	4 19.66	0.472	9 33 35.78	
Sun.	16	9 41 40.39	9.362	13 50 5.1	47.29	4 8.05	0.494	9 37 32.34	
Mon.	17	9 45 24.81	9.340	13 31 3.5	47.83	3 55.92	0.516	9 41 28.89	
Tues.	18	9 49 8.72	9.318	13 11 49.1	48.36	3 43.28	0.538	9 45 25.44	
Wed.	19	9 52 52.11	9.297	12 52 22.3	48.87	3 30.11	0.559	9 49 22.00	
Thur.	20	9 56 34.99	9.276	12 32 43.3	49.37	3 16.44	0.580	9 53 18.55	
Fri.	21	10 0 17.38	9.256	12 12 52.3	49.86	3 2.28	0.600	9 57 15.10	
Sat.	22	10 3 59.29	9.236	11 52 49.7	50.34	2 47.63	0.620	10 1 11.66	
Sun.	23	10 7 40.73	9.217	11 32 35.9	50.80	2 32.52	0.639	10 5 8.21	
Mon.	24	10 11 21.71	9.198	11 12 11.3	51.25	2 16.95	0.658	10 9 4.76	
Tues.	25	10 15 2.25	9.180	10 51 36.1	51.68	2 0.93	0.676	10 13 1.32	
Wed.	26	10 18 42.36	9.163	10 30 50.7	52.10	1 44.49	0.693	10 16 57.87	
Thur.	27	10 22 22.06	9.146	10 9 55.3	52.51	1 27.64	0.709	10 20 54.42	
Fri.	28	10 26 1.38	9.130	9 48 50.2	52.91	1 10.40	0.725	10 24 50.98	
Sat.	29	10 29 40.33	9.115	9 27 35.6	53.30	0 52.80	0.740	10 28 47.53	
Sun.	30	10 33 18.93	9.101	9 6 11.9	53.67	0 34.85	0.754	10 32 44.08	
Mon.	31	10 36 57.20	9.087	8 44 39.3	54.03	0 16.56	0.768	10 36 40.64	
Tues.	32	10 40 35.16	9.075	N. 8 22 58.3	54.37	0 2.03	0.781	10 40 37.19	

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.			
		λ	λ'					
1	213	128 ^o 41' 24."	40' 38.5"	143.52	+0.76	0.0063355	23.7	15 19 5.01
2	214	129 38 49.7	38 3.4	143.56	0.75	.0062779	24.3	15 15 9.10
3	215	130 36 15.8	35 29.4	143.61	0.71	.0062189	24.8	15 11 13.19
4	216	131 33 43.0	32 56.4	143.66	0.64	.0061586	25.4	15 7 17.28
5	217	132 31 11.4	30 24.7	143.71	0.53	.0060968	26.1	15 3 21.37
6	218	133 28 41.1	27 54.3	143.77	0.43	.0060334	26.8	14 59 25.46
7	219	134 26 12.2	25 25.3	143.83	0.30	.0059683	27.5	14 55 29.55
8	220	135 23 44.7	22 57.7	143.88	0.18	.0059014	28.2	14 51 33.64
9	221	136 21 18.6	20 31.4	143.94	+0.05	.0058327	29.0	14 47 37.73
10	222	137 18 53.8	18 6.4	143.99	-0.06	.0057621	29.8	14 43 41.82
11	223	138 16 30.4	15 42.9	144.05	0.16	.0056893	30.7	14 39 45.91
12	224	139 14 8.4	13 20.8	144.11	0.26	.0056143	31.6	14 35 50.01
13	225	140 11 47.8	11 0.1	144.17	0.32	.0055372	32.5	14 31 54.10
14	226	141 9 28.5	8 40.6	144.22	0.26	.0054579	33.5	14 27 58.19
15	227	142 7 10.4	6 22.4	144.27	0.37	.0053763	34.4	14 24 2.28
16	228	143 4 53.5	4 5.4	144.32	0.34	.0052925	35.3	14 20 6.37
17	229	144 2 37.9	1 49.7	144.37	0.29	.0052068	36.1	14 16 10.47
18	230	144 60 23.4	59 35.1	144.42	0.22	.0051191	37.0	14 12 14.56
19	231	145 58 10.1	57 21.6	144.47	-0.10	.0050294	37.8	14 8 18.65
20	232	146 55 58.0	55 9.4	144.52	+0.02	.0049378	38.5	14 4 22.74
21	233	147 53 47.1	52 58.4	144.57	0.15	.0048447	39.1	14 0 26.83
22	234	148 51 37.4	50 48.6	144.62	0.28	.0047502	39.6	13 56 30.93
23	235	149 49 29.0	48 40.1	144.67	0.41	.0046543	40.1	13 52 35.02
24	236	150 47 21.7	46 32.7	144.72	0.54	.0045572	40.6	13 48 39.11
25	237	151 45 15.6	44 26.5	144.77	0.64	.0044591	41.0	13 44 43.20
26	238	152 43 10.8	42 21.6	144.83	0.72	.0043599	41.4	13 40 47.29
27	239	153 41 7.5	40 18.2	144.89	0.77	.0042600	41.7	13 36 51.39
28	240	154 39 5.7	38 16.3	144.95	0.81	.0041595	42.0	13 32 55.48
29	241	155 37 5.4	36 15.9	145.02	0.82	.0040584	42.2	13 28 59.57
30	242	156 35 6.8	34 17.2	145.09	0.78	.0039567	42.5	13 25 3.66
31	243	157 33 9.9	32 20.2	145.17	0.71	.0038542	42.7	13 21 7.75
32	244	158 31 14.8	30 25.0	145.24	+0.62	0.0037511	43.0	13 17 11.86

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S									
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.		
							^h ^m	^m	^d	
1	16 29.2	16 22.9	60 23.9	-1.80	60 0.9	-2.04	14 15.5	2.16	16.5	
2	16 16.0	16 8.5	59 35.3	2.21	59 7.8	2.33	15 6.5	2.09	17.5	
3	16 0.7	15 52.8	58 39.3	2.40	58 10.3	2.40	15 56.2	2.05	18.5	
4	15 45.0	15 37.4	57 41.6	2.36	57 13.6	2.28	16 45.5	2.05	19.5	
5	15 30.1	15 23.1	56 46.7	2.17	56 21.3	2.04	17 34.7	2.06	20.5	
6	15 16.6	15 10.7	55 57.7	1.88	55 36.2	1.71	18 24.1	2.07	21.5	
7	15 5.5	15 0.9	55 16.8	1.53	54 59.5	1.34	19 13.6	2.06	22.5	
8	14 56.8	14 53.3	54 44.4	1.16	54 31.6	0.97	20 2.9	2.05	23.5	
9	14 50.4	14 48.1	54 21.1	0.79	54 12.7	0.61	20 51.6	2.00	24.5	
10	14 46.4	14 45.2	54 6.4	0.44	54 2.1	-0.28	21 39.2	1.96	25.5	
11	14 44.6	14 44.4	53 59.6	-0.12	53 59.0	+0.02	22 25.6	1.90	26.5	
12	14 44.7	14 45.4	54 0.0	+0.15	54 2.5	0.27	23 10.6	1.84	27.5	
13	14 46.4	14 47.8	54 6.4	0.39	54 11.6	0.49	23 54.4	1.80	28.5	
14	14 49.6	14 51.7	54 18.1	0.58	54 25.7	0.68	0 6.4		29.5	
15	14 54.0	14 56.6	54 34.5	0.77	54 44.3	0.86	0 37.4	1.79	0.9	
16	14 59.6	15 2.9	54 55.2	0.95	55 7.2	1.04	1 20.3	1.79	1.9	
17	15 6.5	15 10.4	55 20.3	1.13	55 34.5	1.23	2 3.4	1.82	2.9	
18	15 14.6	15 19.1	55 49.8	1.32	56 6.2	1.42	2 47.9	1.89	3.9	
19	15 23.8	15 28.8	56 23.7	1.50	56 42.2	1.58	3 34.4	1.99	4.9	
20	15 34.1	15 39.7	57 1.7	1.66	57 22.0	1.72	4 23.6	2.12	5.9	
21	15 45.4	15 51.3	57 43.1	1.78	58 4.7	1.82	5 16.1	2.25	6.9	
22	15 57.3	16 3.3	58 26.7	1.83	58 48.8	1.83	6 11.9	2.39	7.9	
23	16 9.2	16 14.8	59 10.4	1.77	59 31.2	1.68	7 10.5	2.48	8.9	
24	16 20.1	16 24.9	59 50.6	1.55	60 8.1	1.37	8 10.5	2.49	9.9	
25	16 29.0	16 32.4	60 23.3	1.15	60 35.6	0.89	9 10.6	2.47	10.9	
26	16 34.8	16 36.2	60 44.5	+0.58	60 49.6	+0.25	10 9.3	2.40	11.9	
27	16 36.5	16 35.6	60 50.5	-0.09	60 47.2	-0.45	11 5.9	2.31	12.9	
28	16 33.5	16 30.3	60 39.7	0.81	60 28.1	1.14	12 0.4	2.22	13.9	
29	16 26.1	16 21.0	60 12.6	1.45	59 53.7	1.71	12 53.0	2.17	14.9	
30	16 15.0	16 8.4	59 31.9	1.93	59 7.7	2.10	13 44.5	2.13	15.9	
31	16 1.4	15 54.0	58 41.8	2.23	58 14.8	2.29	14 35.3	2.11	16.9	
32	15 46.5	15 39.1	57 47.3	-2.29	57 20.0	-2.26	15 26.0	2.11	17.9	

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 1.					MONDAY 3.				
0	^h 22 ^m 23 ^s 48.77	2.3001	S. 4° 35' 33.3"	13.300	0	^h 0 10 ^m 40.86	2.1720	N. 5° 55' 48.3"	12.406
1	22 26 6.68	2.2964	4 22 8.8	13.413	1	0 12 51.13	2.1706	6 8 11.0	12.363
2	22 28 24.35	2.2926	4 8 43.7	13.426	2	0 15 1.32	2.1691	6 20 30.7	12.302
3	22 30 41.79	2.2888	3 55 18.0	13.433	3	0 17 11.43	2.1677	6 32 47.3	12.260
4	22 32 59.00	2.2850	3 41 51.8	13.441	4	0 19 21.45	2.1664	6 45 0.7	12.197
5	22 35 15.99	2.2813	3 28 25.3	13.446	5	0 21 31.40	2.1652	6 57 10.8	12.142
6	22 37 32.76	2.2776	3 14 58.4	13.450	6	0 23 41.27	2.1639	7 9 17.7	12.088
7	22 39 49.32	2.2742	3 1 31.3	13.453	7	0 25 51.07	2.1627	7 21 21.3	12.032
8	22 42 5.67	2.2707	2 48 4.1	13.455	8	0 28 0.80	2.1615	7 33 21.5	11.976
9	22 44 21.81	2.2673	2 34 36.8	13.454	9	0 30 10.46	2.1606	7 45 18.3	11.917
10	22 46 37.75	2.2638	2 21 9.6	13.453	10	0 32 20.06	2.1594	7 57 11.5	11.860
11	22 48 53.49	2.2607	2 7 42.5	13.450	11	0 34 29.60	2.1586	8 9 1.2	11.798
12	22 51 9.03	2.2573	1 54 15.6	13.446	12	0 36 39.08	2.1575	8 20 47.3	11.736
13	22 53 24.37	2.2541	1 40 49.1	13.439	13	0 38 48.50	2.1566	8 32 29.7	11.677
14	22 55 39.52	2.2508	1 27 22.9	13.433	14	0 40 57.87	2.1557	8 44 8.5	11.616
15	22 57 54.47	2.2477	1 13 57.3	13.423	15	0 43 7.18	2.1548	8 55 43.5	11.552
16	23 0 9.24	2.2445	1 0 32.3	13.413	16	0 45 16.45	2.1540	9 7 14.7	11.488
17	23 2 23.82	2.2415	0 47 7.9	13.401	17	0 47 25.67	2.1533	9 18 42.0	11.423
18	23 4 38.22	2.2385	0 33 44.2	13.389	18	0 49 34.84	2.1526	9 30 5.4	11.356
19	23 6 52.43	2.2355	0 20 21.3	13.373	19	0 51 43.97	2.1518	9 41 24.9	11.292
20	23 9 6.48	2.2326	S. 0 6 59.4	13.356	20	0 53 53.06	2.1512	9 52 40.4	11.225
21	23 11 20.35	2.2298	N. 0 6 21.5	13.339	21	0 56 2.11	2.1506	10 3 51.9	11.157
22	23 13 34.06	2.2270	0 19 41.3	13.321	22	0 58 11.13	2.1500	10 14 59.2	11.088
23	23 15 47.60	2.2243	N. 0 32 59.9	13.299	23	1 0 20.11	2.1495	N. 10 26 2.3	11.017
SUNDAY 2.					TUESDAY 4.				
0	23 18 0.97	2.2216	N. 0 46 17.2	13.278	0	1 2 29.07	2.1490	N. 10 37 1.3	10.947
1	23 20 14.19	2.2190	0 59 33.3	13.266	1	1 4 38.00	2.1486	10 47 56.0	10.877
2	23 22 27.25	2.2164	1 12 47.9	13.253	2	1 6 46.89	2.1480	10 58 46.6	10.806
3	23 24 40.15	2.2137	1 26 1.1	13.207	3	1 8 55.76	2.1477	11 9 32.8	10.733
4	23 26 52.90	2.2112	1 39 12.8	13.181	4	1 11 4.61	2.1473	11 20 14.6	10.661
5	23 29 5.50	2.2088	1 52 22.8	13.152	5	1 13 13.43	2.1469	11 30 52.0	10.587
6	23 31 17.95	2.2064	2 5 31.1	13.124	6	1 15 22.24	2.1466	11 41 25.0	10.513
7	23 33 30.26	2.2040	2 18 37.6	13.093	7	1 17 31.03	2.1463	11 51 53.5	10.437
8	23 35 42.43	2.2017	2 31 42.3	13.062	8	1 19 39.80	2.1460	12 2 17.5	10.362
9	23 37 54.47	2.1996	2 44 45.1	13.029	9	1 21 48.56	2.1458	12 12 36.9	10.285
10	23 40 6.38	2.1974	2 57 45.8	12.996	10	1 23 57.30	2.1456	12 22 51.7	10.206
11	23 42 18.17	2.1954	3 10 44.5	12.962	11	1 26 6.04	2.1456	12 33 1.8	10.130
12	23 44 29.83	2.1933	3 23 41.1	12.926	12	1 28 14.77	2.1454	12 43 7.3	10.062
13	23 46 41.37	2.1913	3 36 35.4	12.887	13	1 30 23.49	2.1453	12 53 8.1	9.973
14	23 48 52.78	2.1897	3 49 27.5	12.851	14	1 32 32.21	2.1452	13 3 4.1	9.894
15	23 51 4.07	2.1879	4 2 17.2	12.806	15	1 34 40.92	2.1452	13 12 55.3	9.813
16	23 53 15.24	2.1863	4 15 4.5	12.768	16	1 36 49.63	2.1451	13 22 41.7	9.732
17	23 55 26.30	2.1834	4 27 49.3	12.736	17	1 38 58.33	2.1450	13 32 23.2	9.650
18	23 57 37.25	2.1816	4 40 31.6	12.684	18	1 41 7.03	2.1450	13 41 59.7	9.568
19	23 59 48.10	2.1799	4 53 11.2	12.638	19	1 43 15.73	2.1451	13 51 31.4	9.487
20	0 1 58.84	2.1782	5 5 48.2	12.598	20	1 45 24.44	2.1452	14 0 58.1	9.404
21	0 4 9.49	2.1767	5 18 22.4	12.547	21	1 47 33.16	2.1453	14 10 19.8	9.319
22	0 6 20.04	2.1761	5 30 53.9	12.501	22	1 49 41.88	2.1454	14 19 36.4	9.235
23	0 8 30.50	2.1735	5 43 22.5	12.453	23	1 51 50.61	2.1455	14 28 48.0	9.150
24	0 10 40.86	2.1720	N. 5° 55' 48.3"	12.406	24	1 53 59.34	2.1457	N. 14 37 54.4	9.066

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 5.					FRIDAY 7.				
0	1 ^h 53 ^m 59.34 ^s	2.1457	N.14° 37' 54.4"	9.065	0	3 ^h 37 ^m 18.42 ^s	2.1691	N.20° 6' 21.1"	4.487
1	1 56 8.08	2.1458	14 46 55.7	8.979	1	3 39 27.97	2.1693	20 10 47.2	4.384
2	1 58 16.83	2.1460	14 55 51.9	8.893	2	3 41 37.54	2.1694	20 15 7.2	4.281
3	2 0 25.59	2.1461	15 4 42.9	8.806	3	3 43 47.11	2.1696	20 19 21.0	4.178
4	2 2 34.36	2.1464	15 13 28.6	8.719	4	3 45 56.69	2.1696	20 23 28.6	4.075
5	2 4 43.15	2.1466	15 22 9.0	8.630	5	3 48 6.28	2.1698	20 27 29.9	3.971
6	2 6 51.95	2.1469	15 30 44.2	8.543	6	3 50 15.87	2.1698	20 31 25.1	3.868
7	2 9 0.77	2.1471	15 39 14.1	8.453	7	3 52 25.46	2.1699	20 35 14.2	3.766
8	2 11 9.60	2.1474	15 47 38.6	8.364	8	3 54 35.06	2.1699	20 38 57.0	3.663
9	2 13 18.45	2.1476	15 55 57.7	8.274	9	3 56 44.65	2.1697	20 42 33.6	3.568
10	2 15 27.31	2.1479	16 4 11.5	8.184	10	3 58 54.23	2.1697	20 46 4.0	3.464
11	2 17 36.19	2.1481	16 12 19.8	8.093	11	4 1 3.81	2.1696	20 49 28.1	3.360
12	2 19 45.08	2.1483	16 20 22.7	8.003	12	4 3 13.38	2.1696	20 52 46.0	3.246
13	2 21 53.99	2.1487	16 28 20.0	7.910	13	4 5 22.95	2.1694	20 55 57.7	3.143
14	2 24 2.92	2.1491	16 36 11.9	7.818	14	4 7 32.51	2.1693	20 59 3.1	3.039
15	2 26 11.87	2.1493	16 43 58.2	7.726	15	4 9 42.07	2.1692	21 2 2.3	2.934
16	2 28 20.84	2.1497	16 51 39.0	7.633	16	4 11 51.61	2.1690	21 4 55.2	2.830
17	2 30 29.83	2.1501	16 59 14.2	7.540	17	4 14 1.15	2.1688	21 7 41.9	2.726
18	2 32 38.85	2.1506	17 6 43.8	7.446	18	4 16 10.67	2.1686	21 10 22.3	2.622
19	2 34 47.89	2.1508	17 14 7.7	7.352	19	4 18 20.18	2.1683	21 12 56.4	2.517
20	2 36 56.94	2.1512	17 21 26.0	7.258	20	4 20 29.67	2.1681	21 15 24.3	2.413
21	2 39 6.01	2.1514	17 28 38.6	7.163	21	4 22 39.14	2.1677	21 17 45.9	2.308
22	2 41 15.11	2.1518	17 35 45.5	7.068	22	4 24 48.59	2.1674	21 20 1.2	2.204
23	2 43 24.23	2.1521	N.17° 42' 46.7"	6.973	23	4 26 58.02	2.1670	N.21° 22' 10.3"	2.099
THURSDAY 6.					SATURDAY 8.				
0	2 45 33.36	2.1525	N.17° 49' 42.2"	6.877	0	4 29 7.43	2.1667	N.21° 24' 13.1"	1.996
1	2 47 42.51	2.1528	17 56 31.9	6.780	1	4 31 16.81	2.1662	21 26 9.6	1.890
2	2 49 51.69	2.1532	18 3 15.8	6.684	2	4 33 26.17	2.1658	21 27 59.9	1.786
3	2 52 0.89	2.1535	18 9 53.9	6.587	3	4 35 35.50	2.1652	21 29 43.9	1.681
4	2 54 10.11	2.1539	18 16 26.2	6.490	4	4 37 44.80	2.1647	21 31 21.6	1.577
5	2 56 19.36	2.1543	18 22 52.6	6.391	5	4 39 54.07	2.1643	21 32 53.1	1.472
6	2 58 28.63	2.1547	18 29 13.1	6.293	6	4 42 3.30	2.1637	21 34 18.3	1.368
7	3 0 37.92	2.1550	18 35 27.8	6.196	7	4 44 12.50	2.1630	21 35 37.2	1.263
8	3 2 47.23	2.1553	18 41 36.5	6.097	8	4 46 21.66	2.1624	21 36 49.9	1.159
9	3 4 56.56	2.1556	18 47 39.3	5.998	9	4 48 30.78	2.1618	21 37 56.3	1.055
10	3 7 5.90	2.1559	18 53 36.2	5.899	10	4 50 39.87	2.1613	21 38 56.5	0.951
11	3 9 15.26	2.1561	18 59 27.2	5.800	11	4 52 48.91	2.1603	21 39 50.4	0.847
12	3 11 24.63	2.1564	19 5 12.2	5.701	12	4 54 57.91	2.1596	21 40 38.1	0.743
13	3 13 34.02	2.1568	19 10 51.2	5.600	13	4 57 6.86	2.1589	21 41 19.6	0.639
14	3 15 43.44	2.1571	19 16 24.2	5.500	14	4 59 15.77	2.1580	21 41 54.8	0.535
15	3 17 52.87	2.1573	19 21 51.2	5.399	15	5 1 24.63	2.1572	21 42 23.8	0.431
16	3 20 2.32	2.1576	19 27 12.1	5.299	16	5 3 33.43	2.1563	21 42 46.5	0.327
17	3 22 11.79	2.1580	19 32 27.0	5.199	17	5 5 42.18	2.1555	21 43 3.0	0.222
18	3 24 21.28	2.1582	19 37 35.9	5.098	18	5 7 50.89	2.1545	21 43 13.3	0.119
19	3 26 30.78	2.1584	19 42 38.6	4.998	19	5 9 59.53	2.1533	21 43 17.5	0.017
20	3 28 40.29	2.1586	19 47 35.4	4.896	20	5 12 8.10	2.1523	21 43 15.4	0.086
21	3 30 49.81	2.1588	19 52 26.0	4.793	21	5 14 16.62	2.1516	21 43 7.1	0.189
22	3 32 59.34	2.1589	19 57 10.5	4.691	22	5 16 25.09	2.1506	21 42 52.7	0.292
23	3 35 8.88	2.1590	20 1 48.9	4.588	23	5 18 33.50	2.1497	21 42 32.1	0.395
24	3 37 18.42	2.1591	N.20° 6' 21.1"	4.487	24	5 20 41.85	2.1486	N.21° 42' 5.3"	0.498

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 9.					TUESDAY 11.				
0	5 20 41.85	2.1386	N.21° 42' 5.3"	0.498	0	7 1 34.86	2.0667	N.19° 25' 3.9"	5.083
1	5 22 50.13	2.1374	21 41 32.4	0.890	1	7 3 38.19	2.0644	19 19 56.3	5.169
2	5 24 58.34	2.1363	21 40 53.3	0.703	2	7 5 41.39	2.0622	19 14 43.6	5.355
3	5 27 6.48	2.1348	21 40 8.2	0.803	3	7 7 44.46	2.0602	19 9 25.7	5.341
4	5 29 14.55	2.1336	21 39 16.9	0.906	4	7 9 47.41	2.0480	19 4 2.7	5.426
5	5 31 22.53	2.1325	21 38 19.5	1.007	5	7 11 50.23	2.0459	18 58 34.6	5.511
6	5 33 30.43	2.1313	21 37 16.1	1.108	6	7 13 52.92	2.0437	18 53 1.4	5.606
7	5 35 38.27	2.1300	21 36 6.6	1.209	7	7 15 55.47	2.0414	18 47 23.3	5.678
8	5 37 46.03	2.1288	21 34 51.0	1.310	8	7 17 57.89	2.0392	18 41 40.1	5.761
9	5 39 53.71	2.1273	21 33 29.4	1.410	9	7 20 0.18	2.0370	18 35 52.0	5.843
10	5 42 1.30	2.1260	21 32 1.8	1.511	10	7 22 2.33	2.0348	18 29 59.0	5.925
11	5 44 8.81	2.1246	21 30 28.1	1.611	11	7 24 4.36	2.0327	18 24 1.1	6.006
12	5 46 16.24	2.1234	21 28 48.5	1.711	12	7 26 6.25	2.0305	18 17 58.4	6.088
13	5 48 23.58	2.1216	21 27 2.9	1.810	13	7 28 8.01	2.0282	18 11 50.8	6.167
14	5 50 30.83	2.1208	21 25 11.3	1.909	14	7 30 9.63	2.0260	18 5 38.4	6.247
15	5 52 37.99	2.1188	21 23 13.8	2.006	15	7 32 11.12	2.0238	17 59 21.3	6.325
16	5 54 45.06	2.1173	21 21 10.3	2.107	16	7 34 12.48	2.0216	17 52 59.4	6.404
17	5 56 52.03	2.1154	21 19 0.9	2.206	17	7 36 13.71	2.0194	17 46 32.8	6.483
18	5 58 58.91	2.1140	21 16 45.6	2.304	18	7 38 14.81	2.0173	17 40 1.5	6.561
19	6 1 5.69	2.1122	21 14 24.4	2.402	19	7 40 15.77	2.0149	17 33 25.6	6.638
20	6 3 12.37	2.1107	21 11 57.4	2.500	20	7 42 16.60	2.0127	17 26 45.0	6.716
21	6 5 18.96	2.1090	21 9 24.5	2.597	21	7 44 17.30	2.0108	17 19 59.9	6.790
22	6 7 25.45	2.1074	21 6 45.8	2.694	22	7 46 17.86	2.0083	17 13 10.2	6.866
23	6 9 31.84	2.1067	N.21° 4' 1.2"	2.791	23	7 48 18.29	2.0062	N.17° 6' 16.0"	6.941
MONDAY 10.					WEDNESDAY 12.				
0	6 11 38.13	2.1040	N.21° 1' 10.9"	2.888	0	7 50 18.60	2.0041	N.16° 59' 17.3"	7.016
1	6 13 44.31	2.1022	20 58 14.8	2.983	1	7 52 18.77	2.0018	16 52 14.2	7.089
2	6 15 50.39	2.1004	20 55 13.0	3.079	2	7 54 18.81	1.9997	16 45 6.6	7.163
3	6 17 56.35	2.0985	20 52 5.4	3.173	3	7 56 18.72	1.9974	16 37 54.7	7.236
4	6 20 2.21	2.0967	20 48 52.2	3.266	4	7 58 18.50	1.9952	16 30 38.4	7.307
5	6 22 7.96	2.0949	20 45 33.2	3.353	5	8 0 18.14	1.9930	16 23 17.8	7.378
6	6 24 13.60	2.0930	20 42 8.6	3.448	6	8 2 17.66	1.9908	16 15 53.0	7.449
7	6 26 19.13	2.0912	20 38 38.3	3.542	7	8 4 17.05	1.9888	16 8 23.9	7.520
8	6 28 24.54	2.0893	20 35 2.4	3.645	8	8 6 16.32	1.9867	16 0 50.6	7.590
9	6 30 29.84	2.0873	20 31 20.9	3.737	9	8 8 15.45	1.9846	15 53 13.1	7.669
10	6 32 35.02	2.0853	20 27 33.9	3.830	10	8 10 14.46	1.9825	15 45 31.5	7.728
11	6 34 40.09	2.0835	20 23 41.3	3.923	11	8 12 13.34	1.9803	15 37 45.8	7.796
12	6 36 45.04	2.0816	20 19 43.2	4.015	12	8 14 12.09	1.9783	15 29 56.0	7.864
13	6 38 49.86	2.0794	20 15 39.6	4.106	13	8 16 10.72	1.9761	15 22 2.2	7.930
14	6 40 54.57	2.0774	20 11 30.5	4.197	14	8 18 9.22	1.9741	15 14 4.4	7.997
15	6 42 59.16	2.0756	20 7 16.0	4.288	15	8 20 7.60	1.9720	15 6 2.6	8.063
16	6 45 3.63	2.0734	20 2 56.0	4.378	16	8 22 5.86	1.9700	14 57 56.9	8.129
17	6 47 7.97	2.0713	19 58 30.6	4.468	17	8 24 4.00	1.9681	14 49 47.2	8.193
18	6 49 12.19	2.0692	19 53 59.8	4.558	18	8 26 2.03	1.9662	14 41 33.7	8.267
19	6 51 16.28	2.0673	19 49 23.7	4.647	19	8 27 59.93	1.9640	14 33 16.4	8.330
20	6 53 20.25	2.0651	19 44 42.2	4.736	20	8 29 57.71	1.9621	14 24 55.3	8.393
21	6 55 24.09	2.0630	19 39 55.5	4.823	21	8 31 55.37	1.9601	14 16 30.5	8.444
22	6 57 27.81	2.0609	19 35 3.5	4.910	22	8 33 52.92	1.9582	14 8 2.0	8.506
23	6 59 31.40	2.0588	19 30 6.3	4.997	23	8 35 50.36	1.9563	13 59 29.8	8.567
24	7 1 34.86	2.0567	N.19° 25' 3.9"	5.083	24	8 37 47.68	1.9544	N.13° 50' 54.0"	8.628

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 13.					SATURDAY 15.				
0	8 37 47.68	1.9644	N.13 50 54.0	8.928	0	10 9 54.64	1.8906	N. 5 59 18.5	10.774
1	8 39 44.88	1.9625	13 42 14.6	8.867	1	10 11 48.38	1.8956	5 48 31.2	10.802
2	8 41 41.08	1.9606	13 33 31.6	8.746	2	10 13 42.10	1.8982	5 37 42.3	10.830
3	8 43 38.96	1.9488	13 24 45.1	8.804	3	10 15 35.80	1.8948	5 26 51.8	10.856
4	8 45 35.84	1.9470	13 15 55.1	8.862	4	10 17 29.48	1.8946	5 15 59.6	10.882
5	8 47 32.60	1.9492	13 7 1.6	8.920	5	10 19 23.14	1.8948	5 5 6.0	10.907
6	8 49 29.26	1.9434	12 58 4.7	8.977	6	10 21 16.79	1.8941	4 54 10.8	10.932
7	8 51 25.81	1.9415	12 49 4.4	9.033	7	10 23 10.43	1.8940	4 43 14.1	10.966
8	8 53 22.26	1.9398	12 40 0.8	9.089	8	10 25 4.07	1.8939	4 32 15.9	10.982
9	8 55 18.61	1.9382	12 30 53.9	9.143	9	10 26 57.71	1.8940	4 21 16.3	11.004
10	8 57 14.85	1.9366	12 21 43.8	9.196	10	10 28 51.35	1.8940	4 10 15.4	11.026
11	8 59 11.00	1.9350	12 12 30.4	9.250	11	10 30 44.99	1.8940	3 59 13.2	11.048
12	9 1 7.05	1.9334	12 3 13.8	9.303	12	10 32 38.63	1.8941	3 48 9.7	11.069
13	9 3 3.00	1.9318	11 53 54.0	9.356	13	10 34 32.28	1.8943	3 37 5.0	11.088
14	9 4 58.86	1.9303	11 44 31.1	9.408	14	10 36 25.94	1.8945	3 25 59.1	11.108
15	9 6 54.63	1.9287	11 35 5.2	9.458	15	10 38 19.61	1.8947	3 14 52.1	11.127
16	9 8 50.30	1.9273	11 25 36.2	9.509	16	10 40 13.30	1.8949	3 3 43.9	11.146
17	9 10 45.88	1.9257	11 16 4.2	9.558	17	10 42 7.00	1.8952	2 52 34.7	11.163
18	9 12 41.38	1.9243	11 6 29.3	9.607	18	10 44 0.72	1.8955	2 41 24.4	11.180
19	9 14 36.79	1.9228	10 56 51.4	9.655	19	10 45 54.47	1.8961	2 30 13.2	11.195
20	9 16 32.12	1.9214	10 47 10.7	9.703	20	10 47 48.25	1.8965	2 19 1.0	11.210
21	9 18 27.36	1.9200	10 37 27.1	9.750	21	10 49 42.06	1.8970	2 7 48.0	11.224
22	9 20 22.52	1.9187	10 27 40.7	9.797	22	10 51 35.89	1.8975	1 56 34.1	11.238
23	9 22 17.60	1.9173	N.10 17 51.5	9.843	23	10 53 29.75	1.8980	N. 1 45 19.4	11.251
FRIDAY 14.					SUNDAY 16.				
0	9 24 12.60	1.9160	N.10 7 59.6	9.888	0	10 55 23.65	1.8986	N. 1 34 4.0	11.264
1	9 26 7.52	1.9148	9 58 5.0	9.932	1	10 57 17.59	1.8994	1 22 47.8	11.275
2	9 28 2.37	1.9136	9 48 7.8	9.976	2	10 59 11.58	1.9001	1 11 31.0	11.286
3	9 29 57.13	1.9124	9 38 8.0	10.019	3	11 1 5.61	1.9009	1 0 13.5	11.296
4	9 31 51.86	1.9112	9 28 5.6	10.062	4	11 2 59.69	1.9017	0 48 55.5	11.306
5	9 33 46.51	1.9102	9 18 0.6	10.104	5	11 4 53.82	1.9027	0 37 36.9	11.314
6	9 35 41.09	1.9091	9 7 53.1	10.146	6	11 6 48.01	1.9036	0 26 17.8	11.322
7	9 37 35.60	1.9080	8 57 43.2	10.188	7	11 8 42.26	1.9046	0 14 58.3	11.329
8	9 39 30.05	1.9070	8 47 30.8	10.226	8	11 10 36.56	1.9056	N. 0 3 38.3	11.336
9	9 41 24.44	1.9060	8 37 16.1	10.264	9	11 12 30.92	1.9066	S. 0 7 42.0	11.341
10	9 43 18.77	1.9050	8 26 59.1	10.302	10	11 14 25.35	1.9077	0 19 2.6	11.347
11	9 45 13.05	1.9043	8 16 39.9	10.339	11	11 16 19.85	1.9089	0 30 23.6	11.352
12	9 47 7.28	1.9034	8 6 18.4	10.376	12	11 18 14.41	1.9101	0 41 44.8	11.356
13	9 49 1.45	1.9026	7 55 54.7	10.413	13	11 20 9.05	1.9113	0 53 6.2	11.357
14	9 50 55.58	1.9017	7 45 28.8	10.450	14	11 22 3.77	1.9126	1 4 27.7	11.359
15	9 52 49.66	1.9009	7 35 0.7	10.486	15	11 23 58.57	1.9140	1 15 49.3	11.361
16	9 54 43.69	1.9002	7 24 30.5	10.521	16	11 25 53.45	1.9154	1 27 11.0	11.362
17	9 56 37.68	1.8995	7 13 58.3	10.554	17	11 27 48.42	1.9169	1 38 32.7	11.361
18	9 58 31.64	1.8989	7 3 24.0	10.588	18	11 29 43.48	1.9184	1 49 54.3	11.360
19	10 0 25.55	1.8983	6 52 47.8	10.619	19	11 31 38.63	1.9199	2 1 15.8	11.357
20	10 2 19.43	1.8978	6 42 9.7	10.651	20	11 33 33.87	1.9214	2 12 37.2	11.356
21	10 4 13.27	1.8972	6 31 29.7	10.683	21	11 35 29.22	1.9233	2 23 58.4	11.352
22	10 6 7.09	1.8967	6 20 47.8	10.714	22	11 37 24.66	1.9249	2 35 19.4	11.349
23	10 8 0.88	1.8962	6 10 4.0	10.744	23	11 39 20.21	1.9268	2 46 40.1	11.343
24	10 9 54.64	1.8956	N. 5 59 18.5	10.774	24	11 41 15.87	1.9286	S. 2 58 0.6	11.338

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 17.					WEDNESDAY 19.				
0	^h 11 ^m 41 ^s 15.87	1.9286	S. 2° 58' 0.6"	11.338	0	^h 13 ^m 16 ^s 53.24	2.0748	S. 11° 40' 4.2"	10.060
1	11 43 11.64	1.9303	3 9 20.6	11.331	1	13 18 57.86	2.0791	11 50 7.6	10.031
2	11 45 7.51	1.9321	3 20 40.3	11.324	2	13 21 2.73	2.0834	12 0 8.0	9.983
3	11 47 3.51	1.9343	3 31 59.5	11.316	3	13 23 7.86	2.0877	12 10 5.5	9.933
4	11 48 59.62	1.9362	3 43 18.2	11.308	4	13 25 13.25	2.0920	12 20 0.0	9.883
5	11 50 55.86	1.9384	3 54 36.3	11.297	5	13 27 18.90	2.0963	12 29 51.4	9.830
6	11 52 52.23	1.9404	4 5 53.9	11.287	6	13 29 24.81	2.1007	12 39 39.6	9.778
7	11 54 48.73	1.9426	4 17 10.8	11.276	7	13 31 31.00	2.1053	12 49 24.6	9.723
8	11 56 45.36	1.9449	4 28 27.0	11.264	8	13 33 37.45	2.1098	12 59 6.3	9.668
9	11 58 42.12	1.9472	4 39 42.4	11.251	9	13 35 44.18	2.1144	13 8 44.6	9.610
10	12 0 39.01	1.9494	4 50 57.1	11.238	10	13 37 51.18	2.1190	13 18 19.5	9.552
11	12 2 36.05	1.9518	5 2 10.9	11.223	11	13 39 58.45	2.1236	13 27 50.9	9.493
12	12 4 33.23	1.9541	5 13 23.8	11.208	12	13 42 6.00	2.1282	13 37 18.7	9.434
13	12 6 30.56	1.9567	5 24 35.8	11.192	13	13 44 13.84	2.1331	13 46 43.0	9.375
14	12 8 28.04	1.9592	5 35 46.8	11.176	14	13 46 21.97	2.1378	13 56 3.7	9.316
15	12 10 25.67	1.9618	5 46 56.7	11.157	15	13 48 30.37	2.1424	14 5 20.6	9.251
16	12 12 23.46	1.9644	5 58 5.6	11.139	16	13 50 39.06	2.1472	14 14 33.8	9.186
17	12 14 21.40	1.9671	6 9 13.3	11.119	17	13 52 48.04	2.1520	14 23 43.1	9.122
18	12 16 19.51	1.9698	6 20 19.9	11.099	18	13 54 57.30	2.1568	14 32 48.4	9.057
19	12 18 17.80	1.9726	6 31 25.2	11.077	19	13 57 6.86	2.1617	14 41 49.8	8.990
20	12 20 16.25	1.9756	6 42 29.2	11.056	20	13 59 16.71	2.1666	14 50 47.2	8.923
21	12 22 14.86	1.9783	6 53 31.9	11.033	21	14 1 26.86	2.1717	14 59 40.5	8.853
22	12 24 13.64	1.9812	7 4 33.2	11.010	22	14 3 37.31	2.1767	15 8 29.6	8.784
23	12 26 12.61	1.9843	S. 7 15 33.1	10.986	23	14 5 48.06	2.1817	S. 15 17 14.5	8.713
TUESDAY 18.					THURSDAY 20.				
0	12 28 11.75	1.9873	S. 7 26 31.4	10.961	0	14 7 59.11	2.1867	S. 15 25 55.3	8.643
1	12 30 11.08	1.9904	7 37 28.2	10.933	1	14 10 10.46	2.1917	15 34 31.6	8.568
2	12 32 10.60	1.9935	7 48 23.4	10.906	2	14 12 22.12	2.1967	15 43 3.5	8.496
3	12 34 10.31	1.9967	7 59 16.9	10.878	3	14 14 34.09	2.2020	15 51 30.9	8.419
4	12 36 10.21	1.9999	8 10 8.8	10.850	4	14 16 46.36	2.2071	15 59 53.8	8.344
5	12 38 10.31	2.0033	8 20 58.9	10.820	5	14 18 58.94	2.2123	16 8 12.1	8.267
6	12 40 10.61	2.0066	8 31 47.2	10.790	6	14 21 11.83	2.2174	16 16 25.8	8.189
7	12 42 11.11	2.0101	8 42 33.7	10.768	7	14 23 25.04	2.2227	16 24 34.7	8.108
8	12 44 11.82	2.0135	8 53 18.2	10.736	8	14 25 38.56	2.2279	16 32 38.8	8.027
9	12 46 12.73	2.0169	9 4 0.8	10.693	9	14 27 52.39	2.2331	16 40 38.0	7.945
10	12 48 13.85	2.0204	9 14 41.3	10.659	10	14 30 6.53	2.2383	16 48 32.2	7.863
11	12 50 15.18	2.0240	9 25 19.7	10.622	11	14 32 20.98	2.2434	16 56 21.4	7.777
12	12 52 16.73	2.0276	9 35 55.9	10.586	12	14 34 35.76	2.2486	17 4 5.5	7.692
13	12 54 18.50	2.0313	9 46 30.0	10.550	13	14 36 50.84	2.2542	17 11 44.5	7.607
14	12 56 20.49	2.0350	9 57 1.9	10.513	14	14 39 6.24	2.2596	17 19 18.3	7.521
15	12 58 22.71	2.0388	10 7 31.4	10.473	15	14 41 21.96	2.2646	17 26 46.8	7.431
16	13 0 25.15	2.0426	10 17 58.6	10.433	16	14 43 37.99	2.2699	17 34 10.0	7.343
17	13 2 27.83	2.0466	10 28 23.3	10.391	17	14 45 54.34	2.2752	17 41 27.8	7.252
18	13 4 30.74	2.0506	10 38 45.5	10.350	18	14 48 11.01	2.2806	17 48 40.2	7.161
19	13 6 33.89	2.0546	10 49 5.3	10.308	19	14 50 28.01	2.2860	17 55 47.0	7.066
20	13 8 37.28	2.0586	10 59 22.5	10.265	20	14 52 45.32	2.2913	18 2 48.1	6.973
21	13 10 40.90	2.0634	11 9 37.0	10.220	21	14 55 2.95	2.2966	18 9 43.6	6.877
22	13 12 44.77	2.0686	11 19 48.9	10.175	22	14 57 20.90	2.3018	18 16 33.4	6.782
23	13 14 48.88	2.0706	11 29 58.0	10.127	23	14 59 39.17	2.3070	18 23 17.5	6.686
24	13 16 53.24	2.0748	S. 11 40 4.2	10.080	24	15 1 57.74	2.3123	S. 18 29 55.7	6.587

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 21.					SUNDAY 23.				
0	15 1 57.74	2.3122	S. 18° 29' 55.7"	6.587	0	16 58 33.86	2.5277	S. 21° 33' 23.9"	0.704
1	15 4 16.64	2.3176	18 36 27.9	6.487	1	17 1 5.62	2.5307	21 34 1.9	0.582
2	15 6 35.85	2.3229	18 42 54.2	6.387	2	17 3 37.55	2.5336	21 34 31.3	0.419
3	15 8 55.39	2.3283	18 49 14.4	6.286	3	17 6 9.66	2.5365	21 34 52.2	0.276
4	15 11 15.24	2.3336	18 55 28.5	6.184	4	17 8 41.93	2.5393	21 35 4.4	0.133
5	15 13 35.41	2.3389	19 1 36.4	6.079	5	17 11 14.37	2.5419	21 35 8.1	0.011
6	15 15 55.89	2.3441	19 7 38.0	5.975	6	17 13 46.96	2.5445	21 35 3.1	0.166
7	15 18 16.69	2.3493	19 13 33.3	5.869	7	17 16 19.70	2.5469	21 34 49.3	0.308
8	15 20 37.80	2.3546	19 19 22.3	5.763	8	17 18 52.58	2.5492	21 34 26.8	0.448
9	15 22 59.22	2.3598	19 25 4.8	5.654	9	17 21 25.60	2.5515	21 33 55.6	0.588
10	15 25 20.95	2.3648	19 30 40.8	5.546	10	17 23 58.76	2.5537	21 33 15.7	0.738
11	15 27 42.99	2.3698	19 36 10.2	5.435	11	17 26 32.04	2.5558	21 32 27.0	0.886
12	15 30 5.33	2.3750	19 41 33.0	5.325	12	17 29 5.45	2.5578	21 31 29.5	1.032
13	15 32 27.98	2.3801	19 46 49.1	5.212	13	17 31 38.97	2.5596	21 30 23.1	1.181
14	15 34 50.94	2.3852	19 51 58.4	5.099	14	17 34 12.60	2.5614	21 29 7.8	1.329
15	15 37 14.20	2.3902	19 57 9.9	4.984	15	17 36 46.34	2.5631	21 27 43.7	1.475
16	15 39 37.76	2.3953	20 1 56.5	4.869	16	17 39 20.17	2.5647	21 26 10.8	1.622
17	15 42 1.62	2.4001	20 6 45.2	4.753	17	17 41 54.09	2.5661	21 24 29.0	1.770
18	15 44 25.77	2.4051	20 11 26.9	4.636	18	17 44 28.10	2.5675	21 22 38.4	1.918
19	15 46 50.22	2.4099	20 16 1.5	4.517	19	17 47 2.19	2.5688	21 20 38.9	2.066
20	15 49 14.96	2.4148	20 20 29.0	4.399	20	17 49 36.36	2.5700	21 18 30.5	2.214
21	15 51 40.00	2.4197	20 24 49.3	4.278	21	17 52 10.60	2.5712	21 16 13.1	2.363
22	15 54 5.32	2.4245	20 29 2.4	4.157	22	17 54 44.90	2.5722	21 13 46.9	2.511
23	15 56 30.93	2.4292	S. 20° 33' 8.1"	4.034	23	17 57 19.26	2.5731	S. 21° 11' 11.7"	2.660
SATURDAY 22.					MONDAY 24.				
0	15 58 56.82	2.4339	S. 20° 37' 6.5"	3.913	0	17 59 53.67	2.5739	S. 21° 8' 27.7"	2.808
1	16 1 22.99	2.4384	20 40 57.5	3.798	1	18 2 28.13	2.5746	21 5 34.8	2.956
2	16 3 49.43	2.4430	20 44 41.1	3.684	2	18 5 2.62	2.5752	21 2 33.0	3.104
3	16 6 16.15	2.4475	20 48 17.1	3.567	3	18 7 37.14	2.5757	20 59 22.3	3.252
4	16 8 43.13	2.4520	20 51 45.5	3.451	4	18 10 11.68	2.5761	20 56 2.8	3.400
5	16 11 10.38	2.4564	20 55 6.2	3.332	5	18 12 46.25	2.5768	20 52 34.4	3.548
6	16 13 37.90	2.4608	20 58 19.3	3.214	6	18 15 20.87	2.5766	20 48 57.0	3.696
7	16 16 5.68	2.4651	21 1 24.7	3.094	7	18 17 55.47	2.5767	20 45 10.8	3.843
8	16 18 33.71	2.4694	21 4 22.2	2.974	8	18 20 30.08	2.5768	20 41 15.8	3.990
9	16 21 2.00	2.4736	21 7 11.9	2.853	9	18 23 4.69	2.5767	20 37 12.0	4.136
10	16 23 30.53	2.4777	21 9 53.7	2.732	10	18 25 39.29	2.5766	20 32 59.5	4.282
11	16 25 59.31	2.4817	21 12 27.5	2.607	11	18 28 13.87	2.5768	20 28 38.2	4.427
12	16 28 28.34	2.4857	21 14 53.3	2.484	12	18 30 48.44	2.5760	20 24 8.2	4.573
13	16 30 57.59	2.4896	21 17 11.1	2.360	13	18 33 22.98	2.5754	20 19 29.4	4.719
14	16 33 27.08	2.4934	21 19 20.9	2.235	14	18 35 57.49	2.5748	20 14 41.9	4.864
15	16 35 56.80	2.4973	21 21 22.5	2.108	15	18 38 31.96	2.5748	20 9 45.7	5.008
16	16 38 26.75	2.5009	21 23 15.9	1.979	16	18 41 6.40	2.5736	20 4 40.9	5.152
17	16 40 56.92	2.5046	21 25 1.1	1.854	17	18 43 40.79	2.5727	19 59 27.4	5.296
18	16 43 27.30	2.5081	21 26 38.0	1.727	18	18 46 15.12	2.5718	19 54 5.4	5.439
19	16 45 57.89	2.5116	21 28 6.6	1.600	19	18 48 49.40	2.5707	19 48 34.8	5.581
20	16 48 28.69	2.5150	21 29 26.9	1.469	20	18 51 23.61	2.5697	19 42 55.7	5.723
21	16 50 59.69	2.5183	21 30 38.8	1.328	21	18 53 57.76	2.5685	19 37 8.2	5.862
22	16 53 30.89	2.5216	21 31 42.3	0.998	22	18 56 31.83	2.5673	19 31 12.2	6.002
23	16 56 2.28	2.5247	21 32 37.3	0.847	23	18 59 5.83	2.5659	19 25 7.9	6.142
24	16 58 33.86	2.5277	S. 21° 33' 23.9"	0.704	24	19 1 39.74	2.5646	S. 19° 18' 55.2"	6.281

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 25.					THURSDAY 27.				
0	19 1 39.74	2.5646	S. 19 18 55.2	6.281	0	21 1 54.58	2.4297	S. 11 56 56.4	11.642
1	19 4 13.56	2.5629	19 12 34.1	6.420	1	21 4 20.25	2.4292	11 45 15.5	11.719
2	19 6 47.29	2.5614	19 6 4.8	6.566	2	21 6 45.72	2.4277	11 33 30.1	11.796
3	19 9 20.92	2.5597	18 59 27.3	6.703	3	21 9 10.97	2.4192	11 21 40.2	11.888
4	19 11 54.45	2.5581	18 52 41.6	6.829	4	21 11 36.02	2.4167	11 9 45.9	11.941
5	19 14 27.87	2.5561	18 45 47.8	6.963	5	21 14 0.85	2.4122	10 57 47.3	12.011
6	19 17 1.18	2.5544	18 38 46.0	7.097	6	21 16 25.48	2.4087	10 45 44.6	12.081
7	19 19 34.37	2.5528	18 31 36.1	7.231	7	21 18 49.89	2.4062	10 33 37.8	12.147
8	19 22 7.45	2.5504	18 24 18.3	7.364	8	21 21 14.10	2.4017	10 21 27.0	12.213
9	19 24 40.40	2.5481	18 16 52.6	7.494	9	21 23 38.10	2.3963	10 9 12.4	12.275
10	19 27 13.22	2.5460	18 9 19.0	7.626	10	21 26 1.89	2.3948	9 56 54.0	12.337
11	19 29 45.91	2.5437	18 1 37.7	7.758	11	21 28 25.48	2.3915	9 44 31.9	12.397
12	19 32 18.46	2.5415	17 53 48.6	7.891	12	21 30 48.87	2.3890	9 32 6.3	12.456
13	19 34 50.87	2.5390	17 45 51.9	8.008	13	21 33 12.05	2.3847	9 19 37.2	12.513
14	19 37 23.14	2.5365	17 37 47.6	8.135	14	21 35 35.03	2.3813	9 7 4.7	12.569
15	19 39 55.26	2.5341	17 29 35.7	8.260	15	21 37 57.80	2.3778	8 54 28.9	12.623
16	19 42 27.23	2.5316	17 21 16.4	8.385	16	21 40 20.37	2.3744	8 41 50.0	12.676
17	19 44 59.04	2.5289	17 12 49.7	8.507	17	21 42 42.74	2.3711	8 29 8.0	12.725
18	19 47 30.70	2.5263	17 4 15.6	8.629	18	21 45 4.90	2.3677	8 16 23.0	12.774
19	19 50 2.19	2.5235	16 55 34.3	8.748	19	21 47 26.87	2.3645	8 3 35.1	12.821
20	19 52 33.52	2.5208	16 46 45.8	8.867	20	21 49 48.64	2.3612	7 50 44.5	12.867
21	19 55 4.68	2.5179	16 37 50.2	8.986	21	21 52 10.21	2.3579	7 37 51.2	12.909
22	19 57 35.67	2.5151	16 28 47.6	9.103	22	21 54 31.59	2.3546	7 24 55.4	12.951
23	20 0 6.49	2.5123	S. 16 19 38.0	9.217	23	21 56 52.77	2.3514	S. 7 11 57.1	12.991
WEDNESDAY 26.					FRIDAY 28.				
0	20 2 37.14	2.5094	S. 16 10 21.5	9.332	0	21 59 13.77	2.3482	S. 6 58 56.5	13.030
1	20 5 7.60	2.5069	16 0 58.2	9.445	1	22 1 34.57	2.3462	6 45 53.6	13.066
2	20 7 37.88	2.5038	15 51 28.1	9.557	2	22 3 55.19	2.3421	6 32 48.6	13.102
3	20 10 7.98	2.5001	15 41 51.4	9.666	3	22 6 15.62	2.3380	6 19 41.5	13.134
4	20 12 37.89	2.4971	15 32 8.2	9.774	4	22 8 35.86	2.3338	6 6 32.5	13.167
5	20 15 7.61	2.4938	15 22 18.5	9.879	5	22 10 55.91	2.3297	5 53 21.6	13.197
6	20 17 37.15	2.4907	15 12 22.3	9.983	6	22 13 15.78	2.3257	5 40 8.9	13.226
7	20 20 6.49	2.4874	15 2 19.8	10.093	7	22 15 35.47	2.3217	5 26 54.6	13.252
8	20 22 35.64	2.4842	14 52 11.1	10.197	8	22 17 54.98	2.3185	5 13 38.7	13.277
9	20 25 4.59	2.4809	14 41 56.2	10.298	9	22 20 14.32	2.3150	5 0 21.4	13.300
10	20 27 33.35	2.4778	14 31 35.3	10.399	10	22 22 33.48	2.3119	4 47 2.7	13.322
11	20 30 1.90	2.4748	14 21 8.4	10.497	11	22 24 52.47	2.3151	4 33 42.8	13.341
12	20 32 30.26	2.4710	14 10 35.6	10.595	12	22 27 11.29	2.3123	4 20 21.8	13.360
13	20 34 58.41	2.4675	13 59 57.0	10.691	13	22 29 29.94	2.3095	4 6 59.7	13.377
14	20 37 26.37	2.4643	13 49 12.7	10.786	14	22 31 48.43	2.3067	3 53 36.6	13.393
15	20 39 54.12	2.4608	13 38 22.8	10.878	15	22 34 6.75	2.3040	3 40 12.7	13.406
16	20 42 21.67	2.4574	13 27 27.3	10.970	16	22 36 24.91	2.3013	3 26 48.0	13.417
17	20 44 49.01	2.4540	13 16 26.4	11.060	17	22 38 42.91	2.2987	3 13 22.6	13.427
18	20 47 16.15	2.4505	13 5 20.3	11.149	18	22 41 0.75	2.2960	2 59 56.7	13.436
19	20 49 43.07	2.4470	12 54 8.8	11.234	19	22 43 18.44	2.2935	2 46 30.3	13.443
20	20 52 9.79	2.4435	12 42 52.2	11.320	20	22 45 35.97	2.2909	2 33 3.5	13.449
21	20 54 36.30	2.4401	12 31 30.6	11.402	21	22 47 53.35	2.2884	2 19 36.4	13.453
22	20 57 2.60	2.4366	12 20 4.0	11.484	22	22 50 10.57	2.2859	2 6 9.2	13.456
23	20 59 28.69	2.4332	12 8 32.6	11.563	23	22 52 27.66	2.2835	1 52 41.9	13.456
24	21 1 54.58	2.4297	S. 11 56 56.4	11.642	24	22 54 44.61	2.2811	S. 1 39 14.6	13.456

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 29.					MONDAY 31.				
0	22 54 44.61	2.2611	S. 1 39 14.6	13.455	0	0 42 12.98	2.2111	N. 8 38 25.3	11.784
1	22 57 1.41	2.2706	1 25 47.4	13.452	1	0 44 25.63	2.2106	8 50 10.4	11.730
2	22 59 18.06	2.2764	1 12 20.4	13.448	2	0 46 38.25	2.2100	9 1 51.7	11.655
3	23 1 34.58	2.2743	0 58 53.7	13.445	3	0 48 50.83	2.2094	9 13 29.0	11.569
4	23 3 50.96	2.2719	0 45 27.3	13.437	4	0 51 3.38	2.2089	9 25 2.4	11.522
5	23 6 7.22	2.2698	0 32 1.3	13.428	5	0 53 15.89	2.2083	9 36 31.7	11.454
6	23 8 23.34	2.2678	0 18 35.9	13.419	6	0 55 28.37	2.2078	9 47 56.9	11.386
7	23 10 39.33	2.2655	S. 0 5 11.2	13.406	7	0 57 40.83	2.2076	9 59 18.0	11.316
8	23 12 55.20	2.2634	N. 0 8 12.8	13.394	8	0 59 53.27	2.2071	10 10 34.8	11.246
9	23 15 10.94	2.2613	0 21 35.9	13.378	9	1 2 5.68	2.2067	10 21 47.4	11.174
10	23 17 26.56	2.2593	0 34 58.2	13.363	10	1 4 18.07	2.2063	10 32 55.7	11.102
11	23 19 42.06	2.2573	0 48 19.4	13.345	11	1 6 30.44	2.2059	10 43 59.6	11.030
12	23 21 57.44	2.2554	1 1 39.6	13.327	12	1 8 42.78	2.2055	10 54 59.1	10.954
13	23 24 12.71	2.2536	1 14 58.6	13.307	13	1 10 55.11	2.2053	11 5 54.1	10.878
14	23 26 27.87	2.2518	1 28 16.4	13.286	14	1 13 7.42	2.2050	11 16 44.5	10.803
15	23 28 42.92	2.2499	1 41 32.8	13.263	15	1 15 19.71	2.2047	11 27 30.4	10.726
16	23 30 57.86	2.2482	1 54 47.8	13.238	16	1 17 31.99	2.2044	11 38 11.6	10.649
17	23 33 12.70	2.2464	2 8 1.2	13.211	17	1 19 44.26	2.2043	11 48 48.2	10.571
18	23 35 27.43	2.2447	2 21 13.1	13.185	18	1 21 56.51	2.2041	11 59 20.1	10.493
19	23 37 42.06	2.2431	2 34 23.3	13.156	19	1 24 8.74	2.2038	12 9 47.2	10.412
20	23 39 56.60	2.2414	2 47 31.8	13.127	20	1 26 20.97	2.2036	12 20 9.5	10.332
21	23 42 11.04	2.2399	3 0 38.4	13.094	21	1 28 33.18	2.2035	12 30 26.9	10.249
22	23 44 25.37	2.2383	3 13 43.1	13.063	22	1 30 45.39	2.2034	12 40 39.4	10.167
23	23 46 39.62	2.2368	N. 3 26 45.8	13.027	23	1 32 57.59	2.2033	N.12 50 46.9	10.084
SUNDAY 30.					TUESDAY, SEPTEMBER 1.				
0	23 48 53.81	2.2353	N. 3 39 46.4	12.992	0	1 35 9.78	2.2031	N.13 0 49.5	10.000
1	23 51 7.90	2.2341	3 52 44.8	12.965					
2	23 53 21.90	2.2327	4 5 41.0	12.918					
3	23 55 35.82	2.2313	4 18 34.9	12.879					
4	23 57 49.66	2.2299	4 31 26.5	12.840					
5	0 0 3.42	2.2287	4 44 15.6	12.797					
6	0 2 17.10	2.2274	4 57 2.1	12.755					
7	0 4 30.72	2.2263	5 9 46.0	12.710					
8	0 6 44.26	2.2251	5 22 27.3	12.665					
9	0 8 57.73	2.2240	5 35 5.8	12.618					
10	0 11 11.14	2.2229	5 47 41.5	12.571					
11	0 13 24.48	2.2218	6 0 14.2	12.521					
12	0 15 37.76	2.2208	6 12 44.0	12.472					
13	0 17 50.98	2.2199	6 25 10.8	12.421					
14	0 20 4.15	2.2190	6 37 34.5	12.369					
15	0 22 17.26	2.2180	6 49 55.0	12.314					
16	0 24 30.31	2.2172	7 2 12.2	12.260					
17	0 26 43.30	2.2162	7 14 26.0	12.203					
18	0 28 56.25	2.2155	7 26 36.5	12.147					
19	0 31 9.15	2.2147	7 38 43.6	12.089					
20	0 33 22.01	2.2140	7 50 47.2	12.031					
21	0 35 34.82	2.2131	8 2 47.2	11.970					
22	0 37 47.58	2.2125	8 14 43.6	11.909					
23	0 40 0.30	2.2117	8 26 36.3	11.847					
24	0 42 12.98	2.2111	N. 8 38 25.3	11.784					

PHASES OF THE MOON.

☾ Last Quarter, . . . 5 22 5.6
 ● New Moon, . . . 14 2 2.9
 ☽ First Quarter, . . . 21 18 19.6
 ○ Full Moon, . . . 28 8 54.7

☾ Apogee, 11 10.4
 ☾ Perigee, 26 21.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	Antares W.	88° 35' 28"	9182	90° 25' 38"	9147	92° 15' 26"	9161	94° 4' 52"	9176
	α Aquilæ W.	41 54 8	9201	43 20 16	9143	44 47 33	9096	46 15 48	9064
	α Arietis E.	59 20 15	9169	57 31 0	9185	55 42 10	9201	53 53 44	9220
	Aldebaran E.	92 18 34	9135	90 28 28	9149	88 38 44	9164	86 49 22	9178
2	Antares W.	103 6 4	9259	104 53 4	9277	106 39 37	9294	108 25 45	9318
	α Aquilæ W.	53 47 31	9281	55 19 11	9219	56 51 6	9209	58 23 13	9204
	Fomalhaut W.	31 48 38	4726	32 49 16	4606	33 53 4	4317	34 59 41	4166
	α Arietis E.	44 58 41	2820	43 13 11	2343	41 28 14	2306	39 43 51	2292
	Aldebaran E.	77 48 26	2262	76 1 30	2279	74 15 0	2298	72 28 57	2315
	SUN E.	138 44 47	2674	137 5 16	2691	135 26 9	2690	133 47 26	2626
3	α Aquilæ W.	66 4 38	2907	67 36 48	2914	69 8 49	2920	70 40 41	2930
	Fomalhaut W.	41 4 52	2646	42 22 38	2681	43 41 33	2629	45 1 25	2482
	Aldebaran E.	63 45 23	2410	62 2 3	2429	60 19 10	2449	58 36 45	2469
	SUN E.	125 40 1	2720	124 3 48	2739	122 28 0	2700	120 52 39	2779
4	α Aquilæ W.	78 16 59	2986	79 47 29	3001	81 17 41	3014	82 47 36	3029
	Fomalhaut W.	51 51 14	3340	53 14 39	3324	54 38 23	3313	56 2 20	3301
	α Pegasi W.	30 35 47	3115	32 3 38	3082	33 32 9	3066	35 1 10	3036
	Aldebaran E.	50 11 37	2669	48 31 59	2688	46 52 47	2698	45 14 3	2629
	SUN E.	113 2 20	2677	111 29 32	2696	109 57 10	2917	108 25 13	2938
5	α Aquilæ W.	90 12 25	3110	91 40 22	3129	93 7 57	3146	94 35 11	3164
	Fomalhaut W.	63 4 16	3282	64 28 48	3292	65 53 20	3286	67 17 49	3296
	α Pegasi W.	42 30 53	2993	44 1 14	2992	45 31 37	2993	47 1 58	2996
	Aldebaran E.	37 7 14	2731	35 31 15	2762	33 55 44	2772	32 20 40	2796
	SUN E.	100 51 26	3030	99 21 50	3048	97 52 37	3066	96 23 45	3083
6	α Aquilæ W.	101 45 47	3259	103 10 46	3281	104 35 20	3300	105 59 31	3321
	Fomalhaut W.	74 19 3	3314	75 42 58	3322	77 6 44	3329	78 30 22	3336
	α Pegasi W.	54 32 42	3020	56 2 30	3026	57 32 10	3031	59 1 44	3039
	SUN E.	89 4 42	3167	87 37 53	3181	86 11 21	3198	84 45 9	3212
7	Fomalhaut W.	85 26 1	3363	86 48 37	3392	88 11 3	3409	89 33 17	3419
	α Pegasi W.	66 27 10	3078	67 55 47	3086	69 24 15	3092	70 52 34	3100
	α Arietis W.	22 53 13	3163	24 20 18	3136	25 47 42	3126	27 15 21	3116
	SUN E.	77 38 19	3290	76 13 44	3292	74 49 23	3306	73 25 17	3316
8	Fomalhaut W.	96 21 30	3466	97 42 32	3478	99 3 21	3486	100 23 58	3501
	α Pegasi W.	78 11 55	3136	79 39 22	3143	81 6 41	3146	82 33 52	3156
	α Arietis W.	34 35 18	3102	36 3 25	3101	37 31 33	3102	38 59 40	3103
	SUN E.	66 27 56	3367	65 5 2	3376	63 42 20	3396	62 19 47	3394
9	Fomalhaut W.	107 3 35	3666	108 22 47	3678	109 41 45	3693	111 0 27	3699
	α Pegasi W.	89 47 59	3182	91 14 29	3188	92 40 52	3192	94 7 10	3198
	α Arietis W.	46 19 50	3111	47 47 46	3118	49 15 40	3114	50 43 32	3116
	Aldebaran W.	13 34 30	3346	14 57 48	3300	16 22 0	3266	17 46 53	3236
	SUN E.	55 29 18	3430	54 7 35	3437	52 46 0	3443	51 24 31	3448
10	α Pegasi W.	101 17 18	3319	102 43 5	3323	104 8 47	3327	105 34 24	3330
	α Arietis W.	58 2 27	3123	59 30 10	3121	60 57 54	3123	62 25 36	3123
	Aldebaran W.	24 57 27	3164	26 24 21	3167	27 51 22	3161	29 18 30	3146
	SUN E.	44 38 35	3471	43 17 39	3476	41 56 47	3480	40 36 0	3483

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXh.	P. L. of Diff.
1	Antares W.	95° 53' 55"	2192	97° 42' 34"	2206	99° 30' 49"	2226	101° 18' 39"	2242
	α Aquilæ W.	47 44 54	2018	49 14 45	2006	50 45 13	2065	52 16 9	2046
	α Arietis E.	52 5 46	2226	50 18 15	2206	48 31 14	2278	46 44 42	2299
	Aldebaran E.	85 0 22	2194	83 11 46	2210	81 23 34	2227	79 35 47	2246
2	Antares W.	110 11 25	2201	111 56 39	2260	113 41 26	2260	115 25 45	2280
	α Aquilæ W.	59 55 27	2001	61 27 45	2000	63 0 4	2000	64 32 23	2003
	Fomalhaut W.	36 8 49	4020	37 20 9	3003	38 33 26	3004	39 48 24	3718
	α Arietis E.	38 0 5	2418	36 16 56	2446	34 34 26	2474	32 52 36	2504
	Aldebaran E.	70 43 20	2224	68 58 10	2263	67 13 27	2271	65 29 11	2291
	SUN E.	132 9 7	2044	130 31 12	2064	128 53 44	2061	127 16 39	2701
3	α Aquilæ W.	72 12 23	2030	73 43 53	2049	75 15 10	2061	76 46 12	2073
	Fomalhaut W.	46 22 9	3446	47 43 35	3412	49 5 38	3364	50 28 13	3361
	Aldebaran E.	56 54 48	2480	55 13 19	2508	53 32 17	2528	51 51 43	2548
	SUN E.	119 17 44	2706	117 43 14	2619	116 9 11	2638	114 35 32	2660
4	α Aquilæ W.	84 17 13	3044	85 46 31	3060	87 15 30	3077	88 44 8	3094
	Fomalhaut W.	57 26 30	3294	58 50 49	3298	60 15 14	3264	61 39 44	3292
	α Pegasi W.	36 30 38	3021	38 0 25	3010	39 30 25	3001	41 0 36	2997
	Aldebaran E.	43 35 47	2649	41 57 58	2600	40 20 36	2609	38 43 41	2710
	SUN E.	106 53 39	2966	105 22 30	2974	103 51 45	2994	102 21 25	3011
5	α Aquilæ W.	96 2 3	3188	97 28 33	3202	98 54 40	3220	100 20 26	3241
	Fomalhaut W.	68 42 15	3292	70 6 36	3206	71 30 52	3202	72 55 1	3208
	α Pegasi W.	48 32 16	2996	50 2 31	3002	51 32 41	3007	53 2 45	3013
	Aldebaran E.	30 46 5	2617	29 11 59	2630	27 38 22	2664	26 5 17	2690
	SUN E.	94 55 15	3101	93 27 7	3118	91 59 19	3133	90 31 50	3151
6	α Aquilæ W.	107 23 18	3242	108 46 40	3266	110 9 37	3287	111 32 8	3410
	Fomalhaut W.	79 53 50	3246	81 17 8	3256	82 40 16	3264	84 3 14	3273
	α Pegasi W.	60 31 8	3047	62 0 22	3066	63 29 27	3062	64 58 23	3060
	SUN E.	83 19 14	3226	81 53 36	3240	80 26 14	3264	79 3 9	3267
7	Fomalhaut W.	90 55 19	3423	92 17 9	3422	93 38 48	3444	95 0 15	3454
	α Pegasi W.	72 20 44	3107	73 48 45	3114	75 16 38	3122	76 44 21	3129
	α Arietis W.	28 43 9	3111	30 11 5	3106	31 39 8	3106	33 7 12	3103
	SUN E.	72 1 24	3226	70 37 43	3226	69 14 16	3248	67 51 0	3266
8	Fomalhaut W.	101 44 21	3514	103 4 30	3525	104 24 26	3538	105 44 8	3552
	α Pegasi W.	84 0 55	3161	85 27 51	3166	86 54 41	3173	88 21 23	3178
	α Arietis W.	40 27 46	3106	41 55 50	3107	43 23 51	3107	44 51 52	3110
	SUN E.	60 57 24	3402	59 35 10	3410	58 13 5	3416	56 51 7	3424
9	Fomalhaut W.	112 18 52	3624	113 37 0	3641	114 54 50	3668	116 12 22	3676
	α Pegasi W.	95 33 22	3202	96 59 29	3207	98 25 30	3210	99 51 27	3216
	α Arietis W.	52 11 22	3117	53 39 11	3119	55 6 58	3120	56 34 43	3121
	Aldebaran W.	19 12 17	3216	20 38 5	3200	22 4 16	3184	23 30 47	3172
	SUN E.	50 3 9	3453	48 41 52	3456	47 20 41	3463	45 59 35	3468
10	α Pegasi W.	106 59 58	3234	108 25 27	3237	109 50 52	3242	111 16 12	3246
	α Arietis W.	63 53 19	3122	65 21 1	3123	66 48 44	3123	68 16 27	3121
	Aldebaran W.	30 45 44	3141	32 13 4	3136	33 40 30	3133	35 8 0	3129
	SUN E.	39 15 17	3497	37 54 38	3490	36 34 3	3494	35 13 32	3497

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
11	α Arietis W.	69° 44' 11"	3120	71° 11' 56"	3120	72° 39' 41"	3118	74° 7' 29"	3117
	Aldebaran W.	36 35 34	3126	38 3 12	3123	39 30 54	3119	40 58 40	3116
	Sun E.	33 53 5	3501	32 32 42	3505	31 12 23	3508	29 52 8	3514
16	Sun W.	21 58 10	3385	23 20 44	3365	24 43 40	3348	26 6 56	3333
	Spica E.	37 27 29	2923	35 55 38	2914	34 23 37	2908	32 51 28	2901
	Jupiter E.	38 39 55	3007	37 9 51	3001	35 39 40	2997	34 9 24	2993
	Antares E.	83 0 6	2935	81 28 32	2927	79 56 48	2921	78 24 56	2914
17	Sun W.	33 7 37	3263	34 32 32	3251	35 57 41	3238	37 23 5	3226
	Spica E.	25 8 29	2805	23 35 26	2808	22 2 13	2851	20 28 51	2843
	Antares E.	70 43 20	2877	69 10 32	2870	67 37 35	2862	66 4 28	2855
18	Sun W.	44 33 33	3168	46 0 20	3157	47 27 21	3145	48 54 36	3133
	Antares E.	58 16 15	3013	56 42 5	2998	55 7 44	2795	53 33 11	2788
	α Aquilæ E.	109 46 27	3277	108 21 49	3259	106 56 50	3243	105 31 30	3235
19	Sun W.	56 14 26	3073	57 43 8	3050	59 12 6	3048	60 41 18	3036
	Saturn W.	19 27 12	2997	20 57 28	2943	22 28 40	2916	24 0 40	2900
	Venus W.	15 11 57	2909	16 44 4	2898	18 16 26	2884	19 49 5	2873
	Antares E.	45 37 37	2744	44 1 55	2735	42 26 1	2737	40 49 57	2718
	α Aquilæ E.	98 20 4	3148	96 52 53	3134	95 25 25	3120	93 57 40	3108
20	Sun W.	68 11 18	2970	69 42 8	2948	71 13 14	2945	72 44 36	2931
	Saturn W.	31 50 10	2755	33 25 37	2734	35 1 32	2715	36 37 52	2696
	Venus W.	27 36 31	2805	29 10 53	2793	30 45 32	2778	32 20 29	2763
	Spica W.	13 8 59	2657	14 47 4	2623	16 25 29	2607	18 4 14	2593
	Antares E.	32 46 47	2679	31 9 39	2673	29 32 23	2667	27 54 59	2653
	α Aquilæ E.	86 35 16	3051	85 6 6	3043	83 36 45	3031	82 7 11	3023
	Fomalhaut E.	113 58 29	3198	112 32 5	3168	111 5 11	3138	109 37 47	3114
21	Sun W.	80 25 55	2980	81 59 5	2945	83 32 34	2931	85 6 21	2917
	Saturn W.	44 45 36	2610	46 24 18	2603	48 3 22	2577	49 42 49	2561
	Venus W.	40 19 57	2601	41 56 49	2577	43 34 0	2562	45 11 31	2546
	Spica W.	26 22 52	2523	28 3 33	2510	29 44 33	2495	31 25 52	2482
	Jupiter W.	24 53 15	2535	26 31 22	2516	28 9 55	2507	29 48 54	2509
	α Aquilæ E.	74 36 52	2997	73 6 23	2983	71 35 49	2978	70 5 9	2975
	Fomalhaut E.	102 14 0	3009	100 43 59	2980	99 13 34	2973	97 42 47	2965
22	Sun W.	93 0 3	2744	94 35 45	2728	96 11 48	2713	97 48 10	2699
	Saturn W.	58 5 28	2483	59 47 5	2468	61 29 3	2453	63 11 22	2438
	Venus W.	53 24 15	2571	55 3 50	2556	56 43 46	2540	58 24 3	2526
	Spica W.	39 57 19	2412	41 40 36	2399	43 24 12	2384	45 8 9	2370
	Jupiter W.	38 9 58	2493	39 51 21	2477	41 33 7	2461	43 15 15	2445
	α Aquilæ E.	62 31 25	2980	61 0 47	2965	59 30 16	2953	57 59 55	2938
	Fomalhaut E.	90 3 43	2980	88 30 58	2945	86 57 56	2935	85 24 39	2923
	α Pegasi E.	108 36 8	2567	106 56 28	2553	105 16 28	2535	103 36 4	2520
23	Sun W.	105 54 50	2927	107 33 8	2913	109 11 46	2899	110 50 42	2886
	Saturn W.	71 48 15	2365	73 32 40	2351	75 17 25	2337	77 2 30	2324
	Venus W.	66 50 47	2480	68 33 11	2434	70 15 57	2420	71 59 3	2406
	Spica W.	53 52 54	2302	55 38 51	2289	57 25 7	2274	59 11 44	2261
	Jupiter W.	51 51 20	2371	53 35 36	2357	55 20 13	2343	57 5 12	2329
	α Aquilæ E.	50 32 19	3098	49 4 7	3127	47 36 30	3164	46 9 36	3205
	Fomalhaut E.	77 34 50	2799	76 0 21	2793	74 25 44	2788	72 51 1	2785

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Dist.	XVa.	P. L. of Dist.	XVIa.	P. L. of Dist.	XXIa.	P. L. of Dist.
11	α Arietis	W.	75° 35' 18"	3116	77° 3' 8"	3114	78° 31' 1"	3111	79° 58' 57"	3109
	Aldebaran	W.	42 26 30	3113	43 54 24	3110	45 22 22	3108	46 50 24	3102
	SUN	E.	28 31 59	3018	27 11 55	3035	25 51 58	3031	24 32 8	3030
16	SUN	W.	27 30 31	3317	28 54 23	3302	30 18 32	3288	31 42 57	3276
	Spica	E.	31 19 11	2994	29 46 45	2986	28 14 8	2980	26 41 23	2973
	Jupiter	E.	32 39 3	2989	31 8 37	2986	29 38 7	2983	28 7 33	2981
	Antares	E.	76 52 55	2907	75 20 45	2900	73 48 26	2893	72 15 58	2885
17	SUN	W.	38 48 43	3215	40 14 34	3208	41 40 40	3191	43 7 0	3180
	Spica	E.	18 55 19	2697	17 21 39	2690	15 47 50	2683	14 13 52	2680
	Antares	E.	64 31 12	2646	62 57 44	2638	61 24 5	2629	59 50 15	2622
18	SUN	W.	50 22 6	3123	51 49 49	3110	53 17 47	3098	54 45 59	3086
	Antares	E.	51 58 27	2779	50 23 31	2771	48 48 24	2761	47 13 6	2753
	α Aquilæ	E.	104 5 50	3009	102 39 51	3103	101 13 33	3118	99 46 57	3163
19	SUN	W.	62 10 46	3023	63 40 30	3010	65 10 30	2997	66 40 46	2985
	Saturn	W.	25 33 23	2851	27 6 45	2834	28 40 42	2799	30 15 11	2776
	Venus	W.	21 22 0	2839	22 55 12	2845	24 28 41	2833	26 2 27	2818
	Antares	E.	39 13 41	2709	37 37 13	2701	36 0 35	2693	34 23 46	2686
	α Aquilæ	E.	92 29 40	3008	91 1 25	3084	89 32 56	3073	88 4 13	3061
20	SUN	W.	74 16 16	2916	75 48 14	2903	77 20 30	2889	78 53 3	2874
	Saturn	W.	38 14 37	2678	39 51 47	2680	41 29 20	2643	43 7 17	2626
	Venus	W.	33 55 45	2749	35 31 20	2735	37 7 14	2721	38 43 26	2707
	Spica	W.	19 43 20	2679	21 22 44	2664	23 2 28	2651	24 42 30	2637
	Antares	E.	26 17 30	2680	24 39 57	2680	23 2 24	2663	21 24 54	2670
	α Aquilæ	E.	80 37 27	3014	79 7 32	3006	77 37 27	3000	76 7 14	2993
	Fomalhaut	E.	108 9 55	3091	106 41 35	3070	105 12 49	3049	103 43 37	3029
21	SUN	W.	86 40 27	2801	88 14 53	2788	89 49 36	2773	91 24 40	2758
	Saturn	W.	51 22 37	2646	53 2 48	2630	54 43 20	2615	56 24 13	2599
	Venus	W.	46 49 23	2633	48 27 35	2617	50 6 7	2601	51 45 1	2586
	Spica	W.	33 7 30	2468	34 49 28	2454	36 31 46	2440	38 14 24	2428
	Jupiter	W.	31 28 18	2561	33 8 7	2543	34 48 21	2526	36 28 58	2510
	α Aquilæ	E.	68 34 25	2974	67 3 40	2973	65 32 53	2974	64 2 8	2976
	Fomalhaut	E.	96 11 38	2939	94 40 9	2924	93 8 20	2906	91 36 11	2893
22	SUN	W.	99 24 51	2686	101 1 51	2669	102 39 12	2656	104 16 51	2641
	Saturn	W.	64 54 3	2438	66 37 5	2409	68 20 27	2394	70 4 11	2380
	Venus	W.	60 4 42	2610	61 45 42	2494	63 27 3	2480	65 8 44	2466
	Spica	W.	46 52 27	2367	48 37 4	2344	50 22 0	2329	52 7 17	2315
	Jupiter	W.	44 57 45	2430	46 40 37	2415	48 23 50	2401	50 7 24	2385
	α Aquilæ	E.	56 29 45	3015	54 59 51	3030	53 30 16	3049	52 1 4	3071
	Fomalhaut	E.	83 51 7	2992	82 17 21	2922	80 43 22	2913	79 9 11	2906
	α Pegasi	E.	101 55 18	2604	100 14 10	2498	98 32 40	2473	96 50 49	2459
23	SUN	W.	112 29 56	2672	114 9 29	2659	115 49 21	2646	117 29 30	2634
	Saturn	W.	78 47 54	2311	80 33 39	2298	82 19 42	2285	84 6 4	2273
	Venus	W.	73 42 30	2391	75 26 18	2377	77 10 26	2363	78 54 54	2349
	Spica	W.	60 58 39	2249	62 45 54	2237	64 33 27	2226	66 21 18	2211
	Jupiter	W.	58 50 30	2315	60 36 8	2301	62 22 6	2288	64 8 23	2276
	α Aquilæ	E.	44 43 35	3256	43 18 31	3313	41 54 34	3378	40 31 52	3459
	Fomalhaut	E.	71 16 14	2785	69 41 27	2784	68 6 38	2786	66 31 50	2787

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	α Pegasi E.	95° 8' 38"	2445	93° 26' 7"	2431	91° 43' 16"	2417	90° 0' 5"	2404
24	Sun W.	119 9 56	2621	120 50 40	2610	122 31 39	2498	124 12 55	2487
	Saturn W.	85 52 45	2260	87 39 44	2247	89 27 1	2236	91 14 35	2226
	Venus W.	80 39 42	2236	82 24 49	2223	84 10 15	2210	85 56 0	2200
	Spica W.	68 9 29	2190	69 57 58	2168	71 46 44	2176	73 35 47	2166
	Jupiter W.	65 54 58	2263	67 41 52	2250	69 29 5	2239	71 16 35	2229
	Antares W.	23 8 12	2200	24 54 12	2276	26 40 48	2283	28 27 56	2223
	Fomalhaut E.	64 57 5	2794	63 22 29	2600	61 48 1	2611	60 13 47	2623
	α Pegasi E.	81 19 48	2246	79 34 56	2236	77 49 48	2226	76 4 27	2217
	α Arietis E.	124 38 46	2263	122 51 38	2241	121 4 11	2228	119 16 25	2216
25	Saturn W.	100 16 24	2175	102 5 29	2167	103 54 46	2169	105 44 15	2162
	Venus W.	94 49 7	2241	96 36 33	2221	98 24 14	2222	100 12 9	2212
	Spica W.	82 45 9	2115	84 35 45	2108	86 26 35	2098	88 17 38	2090
	Jupiter W.	80 18 10	2176	82 7 14	2167	83 56 32	2160	85 46 2	2161
	Antares W.	37 30 14	2167	39 19 46	2146	41 9 37	2133	42 59 46	2124
	Fomalhaut E.	52 28 0	2666	50 56 27	2671	49 25 38	2613	47 55 41	2661
	α Pegasi E.	67 14 52	2296	65 28 32	2282	63 42 6	2260	61 55 37	2279
	α Arietis E.	110 12 56	2166	108 23 25	2147	106 33 38	2189	104 43 38	2190
26	Spica W.	97 35 36	2060	99 27 37	2066	101 19 46	2060	103 12 2	2046
	Jupiter W.	94 56 17	2120	96 46 46	2116	98 37 21	2111	100 28 3	2108
	Antares W.	52 13 54	2066	54 5 17	2078	55 56 50	2073	57 48 30	2070
	Fomalhaut E.	40 43 40	2432	39 22 0	2643	38 2 23	2672	36 45 6	2691
	α Pegasi E.	53 3 24	2294	51 17 15	2200	49 31 16	2212	47 45 34	2226
	α Arietis E.	95 30 43	2098	93 39 41	2092	91 48 30	2069	89 57 14	2066
27	Antares W.	67 8 2	2060	69 0 3	2060	70 52 4	2061	72 44 3	2063
	α Pegasi E.	39 3 15	2430	37 20 36	2477	35 38 50	2620	33 58 4	2670
	α Arietis E.	80 40 2	2061	78 48 34	2063	76 57 8	2064	75 5 44	2066
	Aldebaran E.	113 45 42	2060	111 53 41	2061	110 1 41	2061	108 9 42	2063
28	Antares W.	82 2 53	2063	83 54 18	2069	85 45 34	2066	87 36 40	2104
	α Aquilæ W.	37 3 22	2461	38 24 7	2373	39 46 54	2373	41 11 27	2392
	α Arietis E.	65 50 21	2114	63 59 43	2122	62 9 18	2180	60 19 5	2146
	Aldebaran E.	98 50 49	2063	96 59 23	2066	95 8 6	2066	93 16 59	2103
29	Antares W.	96 48 53	2161	98 38 35	2162	100 28 0	2176	102 17 5	2187
	α Aquilæ W.	48 34 3	2644	50 5 26	2612	51 37 30	2667	53 10 6	2666
	α Arietis E.	51 12 2	2202	49 23 37	2217	47 35 35	2233	45 47 56	2240
	Aldebaran E.	84 4 39	2160	82 14 56	2162	80 25 31	2174	78 36 24	2166
30	α Aquilæ W.	60 58 34	2606	62 32 52	2606	64 7 14	2603	65 41 38	2606
	Fomalhaut W.	36 47 16	2660	38 1 17	2748	39 17 13	2653	40 34 50	2670
	α Arietis E.	36 56 37	2266	35 11 58	2280	33 27 55	2400	31 44 33	2446
	Aldebaran E.	69 35 47	2267	67 48 44	2272	66 2 3	2266	64 15 46	2266
	Pollux E.	111 37 53	2232	109 52 26	2236	108 7 19	2249	106 22 31	2264
31	α Aquilæ W.	73 32 31	2636	75 6 14	2644	76 39 45	2666	78 13 2	2667
	Fomalhaut W.	47 21 40	2206	48 45 44	2276	50 10 24	2360	51 35 34	2326
	α Pegasi W.	26 9 40	2169	27 36 2	2116	29 3 53	2067	30 32 55	2013
	Aldebaran E.	55 30 37	2263	53 46 52	2412	52 3 34	2431	50 20 43	2450
	Pollux E.	97 43 58	2443	96 1 25	2461	94 19 17	2477	92 37 32	2496

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
23	α Pegasi	E.	88° 16' 36"	2391	86° 32' 49"	2380	84° 48' 45"	2368	83° 4' 24"	2357
24	Sun	W.	125 54 26	2477	127 36 11	2467	129 18 11	2456	131 0 23	2448
	Saturn	W.	93 2 26	2214	94 50 33	2204	96 38 55	2193	98 27 33	2184
	Venus	W.	87 42 3	2286	89 28 24	2274	91 15 2	2263	93 1 56	2251
	Spica	W.	75 25 8	2164	77 14 45	2144	79 4 37	2133	80 54 46	2124
	Jupiter	W.	73 4 21	2216	74 52 25	2205	76 40 45	2195	78 29 20	2185
	Antares	W.	30 15 34	2215	32 3 39	2190	33 52 8	2183	35 41 1	2170
	Fomalhaut	E.	58 39 49	2289	57 6 12	2259	55 32 57	2249	54 0 12	2205
	α Pegasi	E.	74 18 52	2210	72 33 7	2202	70 47 11	2206	69 1 6	2220
	α Arietis	E.	117 28 20	2202	115 39 55	2190	113 51 12	2178	112 2 12	2168
25	Saturn	W.	107 33 55	2145	109 23 45	2139	111 13 44	2134	113 3 52	2128
	Venus	W.	102 0 18	2204	103 48 39	2196	105 37 12	2189	107 25 56	2182
	Spica	W.	90 8 53	2083	92 0 18	2076	93 51 54	2068	95 43 41	2064
	Jupiter	W.	87 35 44	2143	89 25 37	2136	91 15 41	2130	93 5 55	2124
	Antares	W.	44 50 9	2114	46 40 47	2106	48 31 37	2098	50 22 40	2090
	Fomalhaut	E.	46 26 44	2116	44 58 53	2178	43 32 18	2252	42 7 10	2336
	α Pegasi	E.	60 9 6	2279	58 22 35	2279	56 36 5	2283	54 49 41	2288
	α Arietis	E.	102 53 25	2122	101 3 0	2115	99 12 24	2109	97 21 38	2103
26	Spica	W.	105 4 22	2046	106 56 45	2043	108 49 12	2042	110 41 40	2044
	Jupiter	W.	102 18 50	2106	104 9 40	2106	106 0 32	2103	107 51 27	2102
	Antares	W.	59 40 16	2066	61 32 7	2063	63 24 3	2061	65 16 2	2061
	Fomalhaut	E.	35 30 26	2093	34 18 40	4185	33 10 0	4445	32 5 19	4709
	α Pegasi	E.	46 0 12	2241	44 15 12	2259	42 30 38	2282	40 46 37	2409
	α Arietis	E.	88 5 53	2063	86 14 28	2082	84 23 1	2081	82 31 32	2080
27	Antares	W.	74 35 59	2066	76 27 51	2068	78 19 39	2073	80 11 19	2077
	α Pegasi	E.	32 18 28	2291	30 40 15	2703	29 3 39	2789	27 28 55	2893
	α Arietis	E.	73 14 26	2091	71 23 13	2093	69 32 7	2101	67 41 10	2107
	Aldebaran	E.	106 17 46	2046	104 25 53	2066	102 34 5	2072	100 42 23	2077
28	Antares	W.	89 27 33	2112	91 18 14	2120	93 8 43	2130	94 58 56	2141
	α Aquilæ	W.	42 37 34	2133	44 5 3	2074	45 33 44	2074	47 3 27	2081
	α Arietis	E.	58 29 7	2160	56 39 24	2161	54 49 58	2173	53 0 50	2186
	Aldebaran	E.	91 26 4	2111	89 35 22	2120	87 44 53	2129	85 54 38	2139
29	Antares	W.	104 5 52	2200	105 54 19	2214	107 42 25	2228	109 30 11	2243
	α Aquilæ	W.	54 43 10	2247	56 16 37	2232	57 50 23	2221	59 24 23	2213
	α Arietis	E.	44 0 43	2268	42 13 57	2287	40 27 39	2308	38 41 51	2331
	Aldebaran	E.	76 47 36	2200	74 59 8	2213	73 11 0	2227	71 23 12	2242
30	α Aquilæ	W.	67 16 0	2207	68 50 19	2211	70 24 32	2218	71 58 36	2225
	Fomalhaut	W.	41 53 57	2200	43 14 21	2439	44 35 53	2390	45 58 21	2345
	α Arietis	E.	30 1 55	2474	28 20 5	2611	26 39 7	2653	24 59 8	2600
	Aldebaran	E.	62 29 54	2222	60 44 27	2239	58 59 25	2257	57 14 48	2276
	Pollux	E.	104 38 4	2279	102 53 59	2294	101 10 16	2410	99 26 55	2426
31	α Aquilæ	W.	79 46 3	2279	81 18 48	2295	82 51 13	2309	84 23 20	2324
	Fomalhaut	W.	53 1 10	2211	54 27 6	2196	55 53 20	2185	57 19 47	2177
	α Pegasi	W.	32 2 52	2276	33 33 35	2248	35 4 53	2226	36 36 39	2210
	Aldebaran	E.	48 38 19	2409	46 56 22	2480	45 14 52	2509	43 33 51	2529
	Pollux	E.	90 56 12	2614	89 15 18	2631	87 34 48	2649	85 54 43	2668

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month	THE SUN'S						Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.				
		^h ^m ^s	^s	[°] ['] ["]	["]	['] ["]	^s	^m ^s	^s	
Tues.	1	10 40 35.15	9.075	N. 8 22 58.3	54.37	15 53.72	64.43	0 2.03	0.781	
Wed.	2	10 44 12.78	9.063	8 1 9.4	54.71	15 53.95	64.39	0 20.91	0.793	
Thur.	3	10 47 50.13	9.053	7 39 12.6	55.03	15 54.18	64.35	0 40.06	0.804	
Fri.	4	10 51 27.23	9.043	7 17 8.3	55.36	15 54.41	64.31	0 59.46	0.814	
Sat.	5	10 55 4.11	9.034	6 54 56.8	55.63	15 54.65	64.27	1 19.08	0.823	
Sun.	6	10 58 40.76	9.025	6 32 38.5	55.92	15 54.89	64.24	1 38.92	0.831	
Mon.	7	11 2 17.22	9.017	6 10 13.5	56.19	15 55.12	64.21	1 58.96	0.839	
Tues.	8	11 5 53.50	9.010	5 47 42.2	56.44	15 55.36	64.18	2 19.18	0.846	
Wed.	9	11 9 29.62	9.004	5 25 5.1	56.68	15 55.60	64.16	2 39.56	0.852	
Thur.	10	11 13 5.59	8.998	5 2 22.4	56.90	15 55.85	64.14	3 0.09	0.858	
Fri.	11	11 16 41.44	8.993	4 39 34.7	57.10	15 56.10	64.12	3 20.74	0.863	
Sat.	12	11 20 17.17	8.989	4 16 42.1	57.30	15 56.35	64.10	3 41.50	0.867	
Sun.	13	11 23 52.80	8.985	3 53 44.9	57.48	15 56.61	64.09	4 2.37	0.871	
Mon.	14	11 27 28.36	8.982	3 30 43.5	57.65	15 56.87	64.08	4 23.31	0.874	
Tues.	15	11 31 3.85	8.980	3 7 38.5	57.80	15 57.13	64.07	4 44.31	0.876	
Wed.	16	11 34 39.29	8.978	2 44 30.0	57.94	15 57.39	64.06	5 5.37	0.878	
Thur.	17	11 38 14.69	8.977	2 21 18.4	58.06	15 57.66	64.06	5 26.46	0.879	
Fri.	18	11 41 50.09	8.977	1 58 3.9	58.17	15 57.93	64.06	5 47.56	0.879	
Sat.	19	11 45 25.49	8.978	1 34 47.0	58.26	15 58.20	64.07	6 8.65	0.879	
Sun.	20	11 49 0.90	8.978	1 11 28.3	58.34	15 58.47	64.08	6 29.73	0.878	
Mon.	21	11 52 36.35	8.981	0 48 7.8	58.41	15 58.75	64.09	6 50.77	0.876	
Tues.	22	11 56 11.86	8.984	0 24 45.7	58.46	15 59.03	64.10	7 11.75	0.873	
Wed.	23	11 59 47.46	8.988	N. 0 1 22.5	58.50	15 59.30	64.12	7 32.65	0.868	
Thur.	24	12 3 23.17	8.993	S. 0 22 1.4	58.52	15 59.57	64.14	7 53.43	0.863	
Fri.	25	12 6 59.02	8.999	0 45 25.6	58.53	15 59.85	64.16	8 14.08	0.857	
Sat.	26	12 10 35.02	9.006	1 8 49.8	58.53	16 0.13	64.18	8 34.58	0.851	
Sun.	27	12 14 11.18	9.014	1 32 13.9	58.51	16 0.41	64.21	8 54.91	0.843	
Mon.	28	12 17 47.54	9.022	1 55 37.4	58.48	16 0.68	64.24	9 15.04	0.834	
Tues.	29	12 21 24.13	9.032	2 19 0.1	58.43	16 0.95	64.28	9 34.95	0.824	
Wed.	30	12 25 0.97	9.042	2 42 21.5	58.37	16 1.22	64.32	9 54.62	0.813	
Thur.	31	12 28 38.10	9.054	S. 3 5 41.4	58.30	16 1.49	64.36	10 13.99	0.801	

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		^h ^m ^s	^s	N. [°] ['] ["]	["]	^m ^s	^s	^h ^m ^s
Tues.	1	10 40 35.16	9.075	N. 8 22 58.3	54.37	0 2.03	0.781	10 40 37.19
Wed.	2	10 44 12.83	9.063	8 1 9.1	54.70	0 20.91	0.793	10 44 33.74
Thur.	3	10 47 50.23	9.053	7 39 12.0	55.03	0 40.07	0.804	10 48 30.30
Fri.	4	10 51 27.38	9.043	7 17 7.4	55.34	0 59.47	0.814	10 52 26.85
Sat.	5	10 55 4.31	9.034	6 54 55.6	55.63	1 19.09	0.823	10 56 23.40
Sun.	6	10 58 41.01	9.025	6 32 37.0	55.92	1 38.94	0.831	11 0 19.95
Mon.	7	11 2 17.52	9.017	6 10 11.7	56.19	1 58.99	0.839	11 4 16.51
Tues.	8	11 5 53.85	9.010	5 47 40.1	56.44	2 19.21	0.846	11 8 13.06
Wed.	9	11 9 30.02	9.004	5 25 2.7	56.68	2 39.59	0.852	11 12 9.61
Thur.	10	11 13 6.04	8.998	5 2 19.7	56.90	3 0.13	0.858	11 16 6.17
Fri.	11	11 16 41.94	8.993	4 39 31.6	57.10	3 20.78	0.863	11 20 2.72
Sat.	12	11 20 17.72	8.989	4 16 38.6	57.30	3 41.55	0.867	11 23 59.27
Sun.	13	11 23 53.40	8.985	3 53 41.1	57.48	4 2.42	0.871	11 27 55.82
Mon.	14	11 27 29.01	8.982	3 30 39.4	57.65	4 23.37	0.874	11 31 52.88
Tues.	15	11 31 4.55	8.980	3 7 34.0	57.80	4 44.38	0.876	11 35 48.93
Wed.	16	11 34 40.04	8.978	2 44 25.1	57.94	5 5.44	0.878	11 39 45.48
Thur.	17	11 38 15.50	8.977	2 21 13.1	58.06	5 26.53	0.879	11 43 42.03
Fri.	18	11 41 50.95	8.977	1 57 58.3	58.17	5 47.64	0.879	11 47 38.59
Sat.	19	11 45 26.40	8.978	1 34 41.1	58.26	6 8.74	0.879	11 51 35.14
Sun.	20	11 49 1.86	8.979	1 11 22.0	58.34	6 29.83	0.878	11 55 31.69
Mon.	21	11 52 37.37	8.981	0 48 1.1	58.41	6 50.87	0.876	11 59 28.24
Tues.	22	11 56 12.94	8.984	0 24 38.7	58.46	7 11.85	0.873	12 3 24.79
Wed.	23	11 59 48.59	8.988	N. 0 1 15.2	58.50	7 32.76	0.868	12 7 21.35
Thur.	24	12 3 24.35	8.993	S. 0 22 9.0	58.52	7 53.55	0.863	12 11 17.90
Fri.	25	12 7 0.25	8.999	0 45 33.5	58.53	8 14.20	0.857	12 15 14.45
Sat.	26	12 10 36.30	9.006	1 8 58.1	58.53	8 34.70	0.851	12 19 11.00
Sun.	27	12 14 12.52	9.014	1 32 22.6	58.51	8 55.04	0.843	12 23 7.56
Mon.	28	12 17 48.94	9.022	1 55 46.5	58.48	9 15.17	0.834	12 27 4.11
Tues.	29	12 21 25.58	9.032	2 19 9.5	58.43	9 35.08	0.824	12 31 0.66
Wed.	30	12 25 2.47	9.042	2 42 31.2	58.37	9 54.75	0.813	12 34 57.22
Thur.	31	12 28 39.65	9.054	S. 3 5 51.4	58.30	10 14.12	0.801	12 38 53.77

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour	Mean Time of Sidereal Ob.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.			
		λ	λ'					
1	244	158° 31' 14.8	30' 25.0	145.24	+0.62	0.0037511	43.0	13 ^h 17 ^m 11.86 ^s
2	245	159 29 21.6	28 31.7	145.32	0.52	.0036474	43.3	13 13 15.95
3	246	160 27 30.3	26 40.3	145.40	0.40	.0035430	43.6	13 9 20.04
4	247	161 25 41.0	24 50.9	145.49	0.27	.0034377	44.0	13 5 24.13
5	248	162 23 53.7	23 3.5	145.57	0.15	.0033315	44.4	13 1 28.22
6	249	163 22 8.5	21 18.2	145.66	+0.02	.0032242	44.9	12 57 32.32
7	250	164 20 25.3	19 35.0	145.74	—0.09	.0031158	45.4	12 53 36.41
8	251	165 18 44.2	17 53.8	145.83	0.19	.0030062	45.9	12 49 40.50
9	252	166 17 5.1	16 14.6	145.91	0.25	.0028954	46.4	12 45 44.59
10	253	167 15 27.9	14 37.3	145.99	0.30	.0027832	47.0	12 41 48.68
11	254	168 13 52.8	13 2.1	146.07	0.31	.0026696	47.6	12 37 52.78
12	255	169 12 19.7	11 28.9	146.16	0.28	.0025546	48.2	12 33 56.87
13	256	170 10 48.6	9 57.7	146.24	0.23	.0024382	48.8	12 30 0.96
14	257	171 9 19.2	8 28.2	146.31	0.16	.0023204	49.3	12 26 5.05
15	258	172 7 51.6	7 0.5	146.39	—0.06	.0022013	49.9	12 22 9.15
16	259	173 6 25.9	5 34.7	146.46	+0.07	.0020810	50.4	12 18 13.25
17	260	174 5 1.9	4 10.7	146.53	0.20	.0019596	50.8	12 14 17.34
18	261	175 3 39.5	2 48.2	146.60	0.34	.0018372	51.2	12 10 21.43
19	262	176 2 18.8	1 27.4	146.68	0.47	.0017139	51.5	12 6 25.52
20	263	177 0 59.8	0 8.3	146.75	0.61	.0015899	51.8	12 2 29.62
21	264	177 59 42.6	58 51.0	146.82	0.72	.0014655	52.0	11 58 33.72
22	265	178 58 27.1	57 35.4	146.89	0.81	.0013408	52.1	11 54 37.81
23	266	179 57 13.2	56 21.4	146.96	0.87	.0012158	52.2	11 50 41.90
24	267	180 56 1.0	55 9.1	147.03	0.89	.0010906	52.2	11 46 45.99
25	268	181 54 50.7	53 58.7	147.11	0.90	.0009655	52.1	11 42 50.09
26	269	182 53 42.4	52 50.3	147.19	0.88	.0008407	52.0	11 38 54.19
27	270	183 52 36.0	51 43.9	147.27	0.82	.0007161	51.9	11 34 58.28
28	271	184 51 31.5	50 39.4	147.36	0.74	.0005918	51.7	11 31 2.37
29	272	185 50 29.1	49 36.9	147.45	0.64	.0004679	51.5	11 27 6.46
30	273	186 49 28.8	48 36.5	147.54	0.52	.0003444	51.3	11 23 10.55
31	274	187 48 30.7	47 38.3	147.63	+0.39	0.0002212	51.2	11 19 14.65

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	15 46.5	15 39.1	57 47.3	-2.29	57 20.0	-2.26	^h 15 ^m 26.0	^m 2.11	^d 17.9
2	15 31.9	15 24.9	56 53.3	2.18	56 27.7	2.09	16 16.6	2.10	18.9
3	15 18.3	15 12.3	56 3.6	1.93	55 41.3	1.77	17 7.2	2.10	19.9
4	15 6.8	15 1.9	55 21.2	1.59	55 3.3	1.39	17 57.3	2.08	20.9
5	14 57.7	14 54.1	54 47.8	1.19	54 34.7	0.98	18 46.7	2.04	21.9
6	14 51.2	14 49.0	54 24.2	0.77	54 16.1	0.57	19 34.9	1.98	22.9
7	14 47.5	14 46.6	54 10.5	-0.37	54 7.2	-0.17	20 21.7	1.92	23.9
8	14 46.3	14 46.6	54 6.2	+0.01	54 7.4	+0.19	21 7.1	1.86	24.9
9	14 47.5	14 48.9	54 10.4	0.35	54 15.6	0.50	21 51.4	1.82	25.9
10	14 50.7	14 53.0	54 22.3	0.62	54 30.5	0.75	22 34.8	1.80	26.9
11	14 55.6	14 58.5	54 40.0	0.85	54 50.7	0.93	23 18.0	1.80	27.9
12	15 1.6	15 5.0	55 2.4	1.01	55 14.8	1.07	6		28.9
13	15 8.6	15 12.4	55 27.9	1.12	55 41.6	1.17	0 1.6	1.83	0.3
14	15 16.2	15 20.1	55 55.8	1.19	56 10.3	1.21	0 46.3	1.89	1.3
15	15 24.1	15 28.2	56 25.0	1.23	56 39.9	1.25	1 32.7	1.98	2.3
16	15 32.4	15 36.6	56 55.0	1.27	57 10.3	1.28	2 21.5	2.09	3.3
17	15 40.7	15 44.8	57 25.6	1.28	57 41.0	1.28	3 13.0	2.21	4.3
18	15 49.0	15 53.2	57 56.4	1.27	58 11.7	1.26	4 7.4	2.32	5.3
19	15 57.3	16 1.3	58 26.8	1.25	58 41.6	1.21	5 4.1	2.41	6.3
20	16 5.2	16 8.9	58 55.9	1.17	59 9.5	1.10	6 2.1	2.41	7.3
21	16 12.4	16 15.5	59 22.2	1.02	59 33.7	0.90	7 0.3	2.41	8.3
22	16 18.2	16 20.4	59 43.6	0.75	59 51.7	0.59	7 57.5	2.34	9.3
23	16 22.0	16 22.9	59 57.5	+0.39	60 0.9	+0.17	8 53.1	2.27	10.3
24	16 23.1	16 22.5	60 1.5	-0.08	59 59.1	-0.32	9 47.0	2.21	11.3
25	16 21.0	16 18.6	59 53.7	0.58	59 45.2	0.84	10 39.4	2.16	12.3
26	16 15.5	16 11.6	59 33.6	1.09	59 19.2	1.32	11 31.0	2.14	13.3
27	16 6.9	16 1.7	59 2.1	1.53	58 42.8	1.69	12 21.2	2.14	14.3
28	15 55.9	15 49.7	58 21.6	1.83	57 59.0	1.93	13 13.6	2.15	15.3
29	15 43.4	15 36.9	57 35.6	1.97	57 11.8	1.98	14 5.2	2.15	16.3
30	15 30.4	15 24.1	56 47.9	1.97	56 24.7	1.90	14 56.9	2.15	17.3
31	15 18.0	15 12.3	56 2.5	-1.80	55 41.6	-1.68	15 48.3	2.12	18.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 1.					THURSDAY 3.				
0	1 ^h 35 ^m 9.78 ^s	2.2081	N.13° 0' 49.5"	10.000	0	3 ^h 20 ^m 52.82 ^s	2.2008	N.19° 13' 36.8"	5.264
1	1 37 21.96	2.2029	13 10 47.0	9.917	1	3 23 4.86	2.2006	19 18 55.5	5.266
2	1 39 34.13	2.2028	13 20 39.5	9.832	2	3 25 16.88	2.2003	19 24 7.8	5.153
3	1 41 46.29	2.2027	13 30 26.8	9.746	3	3 27 28.89	2.2000	19 29 13.9	5.048
4	1 43 58.45	2.2027	13 40 9.0	9.660	4	3 29 40.88	2.1997	19 34 13.6	4.943
5	1 46 10.61	2.2026	13 49 46.0	9.573	5	3 31 52.86	2.1995	19 39 6.9	4.838
6	1 48 22.76	2.2025	13 59 17.7	9.485	6	3 34 4.82	2.1992	19 43 53.9	4.730
7	1 50 34.91	2.2024	14 8 44.1	9.396	7	3 36 16.76	2.1989	19 48 34.5	4.623
8	1 52 47.05	2.2024	14 18 5.2	9.307	8	3 38 28.67	2.1984	19 53 8.7	4.517
9	1 54 59.20	2.2024	14 27 20.9	9.217	9	3 40 40.56	2.1980	19 57 36.5	4.411
10	1 57 11.34	2.2024	14 36 31.2	9.127	10	3 42 52.43	2.1976	20 1 58.0	4.306
11	1 59 23.49	2.2024	14 45 36.1	9.036	11	3 45 4.27	2.1971	20 6 13.1	4.198
12	2 1 35.62	2.2024	14 54 35.5	8.945	12	3 47 16.08	2.1967	20 10 21.8	4.091
13	2 3 47.77	2.2024	15 3 29.4	8.853	13	3 49 27.87	2.1963	20 14 24.1	3.984
14	2 5 59.91	2.2024	15 12 17.8	8.761	14	3 51 39.62	2.1967	20 18 19.9	3.877
15	2 8 12.06	2.2025	15 21 0.6	8.668	15	3 53 51.34	2.1961	20 22 9.4	3.771
16	2 10 24.21	2.2025	15 29 37.9	8.574	16	3 56 3.03	2.1945	20 25 52.4	3.664
17	2 12 36.36	2.2026	15 38 9.6	8.481	17	3 58 14.68	2.1939	20 29 29.0	3.556
18	2 14 48.52	2.2026	15 46 35.6	8.386	18	4 0 26.30	2.1933	20 32 59.1	3.449
19	2 17 0.68	2.2027	15 54 55.9	8.291	19	4 2 37.88	2.1927	20 36 22.8	3.343
20	2 19 12.84	2.2027	16 3 10.5	8.195	20	4 4 49.43	2.1921	20 39 40.1	3.235
21	2 21 25.00	2.2027	16 11 19.3	8.099	21	4 7 0.94	2.1914	20 42 51.0	3.127
22	2 23 37.16	2.2027	16 19 22.4	8.003	22	4 9 12.40	2.1907	20 45 55.4	3.020
23	2 25 49.32	2.2027	N.16 27 19.7	7.906	23	4 11 23.82	2.1899	N.20 48 53.4	2.913
WEDNESDAY 2.					FRIDAY 4.				
0	2 28 1.49	2.2027	N.16 35 11.1	7.808	0	4 13 35.19	2.1891	N.20 51 44.9	2.806
1	2 30 13.65	2.2027	16 42 56.7	7.710	1	4 15 46.51	2.1883	20 54 30.0	2.698
2	2 32 25.82	2.2027	16 50 36.3	7.612	2	4 17 57.79	2.1875	20 57 8.7	2.592
3	2 34 37.99	2.2028	16 58 10.1	7.513	3	4 20 9.02	2.1868	20 59 41.0	2.486
4	2 36 50.16	2.2028	17 5 37.9	7.414	4	4 22 20.20	2.1860	21 2 6.9	2.379
5	2 39 2.38	2.2028	17 12 59.8	7.315	5	4 24 31.33	2.1850	21 4 26.4	2.271
6	2 41 14.50	2.2028	17 20 15.7	7.216	6	4 26 42.40	2.1841	21 6 39.4	2.165
7	2 43 26.67	2.2028	17 27 25.6	7.116	7	4 28 53.41	2.1831	21 8 46.0	2.057
8	2 45 38.83	2.2028	17 34 29.5	7.014	8	4 31 4.37	2.1821	21 10 46.2	1.951
9	2 47 51.00	2.2028	17 41 27.3	6.913	9	4 33 15.26	2.1811	21 12 40.0	1.844
10	2 50 3.16	2.2027	17 48 19.1	6.812	10	4 35 26.10	2.1800	21 14 27.5	1.738
11	2 52 15.32	2.2026	17 55 4.8	6.711	11	4 37 36.88	2.1790	21 16 8.5	1.631
12	2 54 27.47	2.2026	18 1 44.4	6.609	12	4 39 47.60	2.1780	21 17 43.2	1.525
13	2 56 39.62	2.2025	18 8 17.9	6.507	13	4 41 58.25	2.1769	21 19 11.5	1.418
14	2 58 51.77	2.2025	18 14 45.2	6.404	14	4 44 8.83	2.1758	21 20 33.4	1.312
15	3 1 3.92	2.2024	18 21 6.3	6.301	15	4 46 19.34	2.1747	21 21 48.9	1.206
16	3 3 16.06	2.2023	18 27 21.3	6.198	16	4 48 29.79	2.1735	21 22 58.1	1.100
17	3 5 28.19	2.2021	18 33 30.1	6.095	17	4 50 40.16	2.1723	21 24 0.9	0.994
18	3 7 40.31	2.2020	18 39 32.7	5.991	18	4 52 50.46	2.1710	21 24 57.4	0.888
19	3 9 52.42	2.2018	18 45 29.0	5.887	19	4 55 0.68	2.1697	21 25 47.5	0.783
20	3 12 4.53	2.2016	18 51 19.1	5.783	20	4 57 10.82	2.1684	21 26 31.3	0.677
21	3 14 16.62	2.2014	18 57 2.9	5.678	21	4 59 20.88	2.1670	21 27 8.7	0.573
22	3 16 28.70	2.2012	19 2 40.5	5.574	22	5 1 30.86	2.1657	21 27 39.9	0.467
23	3 18 40.77	2.2010	19 8 11.8	5.469	23	5 3 40.76	2.1643	21 28 4.8	0.362
24	3 20 52.82	2.2008	N.19 13 36.8	5.364	24	5 5 50.58	2.1629	N.21 28 23.4	0.257

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 5.					MONDAY 7.				
0	h m s	"	N.21° 28' 23.4"	0.387	0	h m s	"	N.19° 45' 28.8"	4.416
1	5 5 50.58	2.1620	21 28 23.4	0.183	1	6 47 37.75	2.0716	19 41 1.1	4.505
2	5 8 0.31	2.1616	21 28 35.7	0.048	2	6 49 41.97	2.0692	19 36 28.2	4.593
3	5 10 9.96	2.1600	21 28 41.8	0.064	3	6 51 46.05	2.0670	19 31 50.0	4.681
4	5 12 19.52	2.1586	21 28 41.7	0.064	4	6 53 50.00	2.0648	19 27 6.5	4.767
5	5 14 28.99	2.1571	21 28 35.3	0.166	5	6 55 53.82	2.0626	19 22 17.9	4.853
6	5 16 38.37	2.1556	21 28 22.7	0.362	6	6 57 57.50	2.0602	19 17 24.1	4.939
7	5 18 47.66	2.1540	21 28 3.9	0.365	7	7 0 1.04	2.0580	19 12 25.1	5.025
8	5 20 56.85	2.1524	21 27 38.9	0.468	8	7 2 4.45	2.0558	19 7 21.1	5.110
9	5 23 5.95	2.1508	21 27 7.8	0.570	9	7 4 7.73	2.0536	19 2 12.0	5.194
10	5 25 14.95	2.1493	21 26 30.5	0.673	10	7 6 10.87	2.0513	18 56 57.8	5.278
11	5 27 23.86	2.1475	21 25 47.1	0.774	11	7 8 13.87	2.0489	18 51 38.6	5.362
12	5 29 32.67	2.1459	21 24 57.5	0.877	12	7 10 16.74	2.0467	18 46 14.3	5.445
13	5 31 41.37	2.1443	21 24 1.8	0.979	13	7 12 19.48	2.0444	18 40 45.1	5.528
14	5 33 49.97	2.1424	21 23 0.0	1.080	14	7 14 22.07	2.0421	18 35 10.9	5.610
15	5 35 58.46	2.1407	21 21 52.2	1.181	15	7 16 24.53	2.0398	18 29 31.9	5.692
16	5 38 6.85	2.1390	21 20 38.3	1.283	16	7 18 26.85	2.0376	18 23 47.9	5.774
17	5 40 15.14	2.1373	21 19 18.3	1.383	17	7 20 29.04	2.0353	18 17 59.1	5.854
18	5 42 23.32	2.1354	21 17 52.3	1.483	18	7 22 31.09	2.0331	18 12 5.4	5.934
19	5 44 31.39	2.1336	21 16 20.3	1.583	19	7 24 33.01	2.0308	18 6 6.9	6.016
20	5 46 39.35	2.1318	21 14 42.3	1.683	20	7 26 34.79	2.0286	17 53 55.6	6.173
21	5 48 47.20	2.1299	21 12 58.4	1.783	21	7 28 36.44	2.0264	17 47 42.9	6.251
22	5 50 54.94	2.1280	21 11 8.5	1.882	22	7 30 37.96	2.0242	17 41 25.5	6.329
23	5 53 2.56	2.1261	21 9 12.6	1.980	23	7 32 39.34	2.0219		
	5 55 10.07	2.1243	N.21 7 10.8	2.078		7 34 40.59	2.0197		
SUNDAY 6.					TUESDAY 8.				
0	5 57 17.46	2.1223	N.21 5 3.2	2.176	0	7 36 41.70	2.0176	N.17 35 3.4	6.406
1	5 59 24.73	2.1203	21 2 49.7	2.274	1	7 38 42.68	2.0153	17 28 36.7	6.483
2	6 1 31.89	2.1182	21 0 30.3	2.371	2	7 40 43.54	2.0132	17 22 5.5	6.560
3	6 3 38.93	2.1163	20 58 5.1	2.468	3	7 42 44.26	2.0110	17 15 29.7	6.636
4	6 5 45.85	2.1143	20 55 34.1	2.565	4	7 44 44.86	2.0089	17 8 49.3	6.710
5	6 7 52.65	2.1123	20 52 57.3	2.662	5	7 46 45.32	2.0067	17 2 4.4	6.785
6	6 9 59.33	2.1103	20 50 14.7	2.758	6	7 48 45.66	2.0046	16 55 15.1	6.860
7	6 12 5.89	2.1082	20 47 26.4	2.853	7	7 50 45.87	2.0026	16 48 21.3	6.933
8	6 14 12.32	2.1061	20 44 32.4	2.948	8	7 52 45.96	2.0004	16 41 23.2	7.006
9	6 16 18.63	2.1041	20 41 32.7	3.043	9	7 54 45.92	1.9982	16 34 20.7	7.078
10	6 18 24.81	2.1020	20 38 27.3	3.137	10	7 56 45.75	1.9962	16 27 13.8	7.150
11	6 20 30.87	2.0999	20 35 16.3	3.231	11	7 58 45.46	1.9941	16 20 2.6	7.222
12	6 22 36.80	2.0977	20 31 59.6	3.324	12	8 0 45.04	1.9920	16 12 47.2	7.292
13	6 24 42.60	2.0956	20 28 37.3	3.418	13	8 2 44.50	1.9900	16 5 27.5	7.363
14	6 26 48.27	2.0934	20 25 9.4	3.511	14	8 4 43.84	1.9880	15 58 3.6	7.433
15	6 28 53.81	2.0912	20 21 36.0	3.603	15	8 6 43.05	1.9860	15 50 35.5	7.503
16	6 30 59.21	2.0890	20 17 57.0	3.696	16	8 8 42.15	1.9839	15 43 3.3	7.571
17	6 33 4.49	2.0869	20 14 12.5	3.787	17	8 10 41.12	1.9819	15 35 26.9	7.640
18	6 35 9.64	2.0847	20 10 22.5	3.878	18	8 12 39.98	1.9800	15 27 46.5	7.708
19	6 37 14.66	2.0826	20 6 27.1	3.969	19	8 14 38.72	1.9781	15 20 2.0	7.776
20	6 39 19.54	2.0803	20 2 26.2	4.060	20	8 16 37.35	1.9762	15 12 13.4	7.843
21	6 41 24.29	2.0781	19 58 19.9	4.150	21	8 18 35.86	1.9743	15 4 20.8	7.909
22	6 43 28.91	2.0759	19 54 8.2	4.239	22	8 20 34.25	1.9723	14 56 24.3	7.974
23	6 45 33.40	2.0737	19 49 51.2	4.328	23	8 22 32.53	1.9704	14 48 23.9	8.039
24	6 47 37.75	2.0716	N.19 45 28.8	4.416	24	8 24 30.70	1.9686	N.14 40 19.6	8.103

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 9.					FRIDAY 11.				
0	^h 8 ^m 24 ^s 30.70	1.9098	N. 14° 40' 19.6	8.108	0	^h 9 ^m 57 ^s 22.24	1.9128	N. 7° 8' 3.4	10.508
1	8 26 28.75	1.9097	14 32 11.5	8.108	1	9 59 16.97	1.9121	6 57 31.8	10.543
2	8 28 26.70	1.9096	14 23 59.5	8.281	2	10 1 11.69	1.9118	6 46 58.2	10.576
3	8 30 24.54	1.9093	14 15 43.7	8.384	3	10 3 6.39	1.9116	6 36 22.6	10.610
4	8 32 22.28	1.9016	14 7 24.2	8.356	4	10 5 1.07	1.9113	6 25 45.0	10.643
5	8 34 19.92	1.9097	13 59 1.0	8.417	5	10 6 55.74	1.9111	6 15 5.5	10.678
6	8 36 17.45	1.9090	13 50 34.1	8.478	6	10 8 50.40	1.9110	6 4 24.0	10.706
7	8 38 14.88	1.9092	13 42 3.5	8.540	7	10 10 45.05	1.9108	5 53 40.7	10.738
8	8 40 12.20	1.9046	13 33 29.3	8.600	8	10 12 39.69	1.9107	5 42 55.5	10.768
9	8 42 9.42	1.9029	13 24 51.5	8.669	9	10 14 34.33	1.9107	5 32 8.6	10.797
10	8 44 6.55	1.9014	13 16 10.2	8.717	10	10 16 28.97	1.9106	5 21 19.9	10.826
11	8 46 3.58	1.9008	13 7 25.4	8.776	11	10 18 23.61	1.9106	5 10 29.5	10.864
12	8 48 0.51	1.9003	12 58 37.1	8.833	12	10 20 18.26	1.9109	4 59 37.4	10.891
13	8 49 57.36	1.9007	12 49 45.4	8.891	13	10 22 12.91	1.9110	4 48 43.7	10.908
14	8 51 54.11	1.9002	12 40 50.2	8.947	14	10 24 7.58	1.9113	4 37 48.5	10.933
15	8 53 50.77	1.9037	12 31 51.7	9.003	15	10 26 2.26	1.9114	4 26 51.7	10.969
16	8 55 47.35	1.9033	12 22 49.8	9.069	16	10 27 56.95	1.9117	4 15 53.4	10.983
17	8 57 43.84	1.9008	12 13 44.6	9.113	17	10 29 51.66	1.9120	4 4 53.7	11.007
18	8 59 40.24	1.9004	12 4 36.2	9.167	18	10 31 46.39	1.9128	3 53 52.6	11.030
19	9 1 36.56	1.9000	11 55 24.5	9.222	19	10 33 41.14	1.9127	3 42 50.1	11.053
20	9 3 32.80	1.9006	11 46 9.6	9.274	20	10 35 35.91	1.9131	3 31 46.3	11.073
21	9 5 28.06	1.9063	11 36 51.6	9.327	21	10 37 30.71	1.9136	3 20 41.3	11.094
22	9 7 25.04	1.9040	11 27 30.4	9.378	22	10 39 25.54	1.9143	3 9 35.0	11.114
23	9 9 21.05	1.9026	N. 11 18 6.2	9.429	23	10 41 20.41	1.9148	N. 2 58 27.5	11.134
THURSDAY 10.					SATURDAY 12.				
0	9 11 16.98	1.9016	N. 11 8 88.9	9.480	0	10 43 15.31	1.9154	N. 2 47 18.9	11.163
1	9 13 12.84	1.9003	10 59 8.5	9.531	1	10 45 10.25	1.9160	2 36 9.2	11.171
2	9 15 8.62	1.9022	10 49 35.2	9.579	2	10 47 5.23	1.9166	2 24 58.4	11.186
3	9 17 4.34	1.9081	10 39 58.9	9.626	3	10 49 0.25	1.9173	2 13 46.6	11.204
4	9 18 59.99	1.9070	10 30 19.8	9.676	4	10 50 55.31	1.9181	2 2 33.9	11.226
5	9 20 55.58	1.9060	10 20 37.8	9.724	5	10 52 50.42	1.9189	1 51 20.2	11.236
6	9 22 51.10	1.9049	10 10 52.9	9.771	6	10 54 45.58	1.9198	1 40 5.6	11.260
7	9 24 46.56	1.9039	10 1 5.2	9.818	7	10 56 40.79	1.9207	1 28 50.2	11.283
8	9 26 41.97	1.9030	9 51 14.8	9.863	8	10 58 36.06	1.9216	1 17 34.0	11.376
9	9 28 37.32	1.9021	9 41 21.6	9.908	9	11 0 31.38	1.9226	1 6 17.1	11.398
10	9 30 32.62	1.9013	9 31 25.8	9.962	10	11 2 26.77	1.9237	0 54 59.4	11.399
11	9 32 27.86	1.9003	9 21 27.3	9.997	11	11 4 22.22	1.9248	0 43 41.1	11.316
12	9 34 23.06	1.9006	9 11 26.2	10.040	12	11 6 17.74	1.9256	0 32 22.2	11.330
13	9 36 18.21	1.9008	9 1 22.5	10.083	13	11 8 13.32	1.9270	0 21 2.8	11.339
14	9 38 13.31	1.9011	8 51 16.3	10.124	14	11 10 8.96	1.9283	N. 0 9 42.8	11.338
15	9 40 8.37	1.9013	8 41 7.6	10.165	15	11 12 4.69	1.9295	S. 0 1 37.6	11.344
16	9 42 3.38	1.9016	8 30 56.5	10.206	16	11 14 0.50	1.9309	0 12 58.5	11.360
17	9 43 58.35	1.9019	8 20 42.9	10.246	17	11 15 56.39	1.9323	0 24 19.7	11.367
18	9 45 53.29	1.9023	8 10 27.0	10.285	18	11 17 52.36	1.9336	0 35 41.3	11.381
19	9 47 48.19	1.9028	8 0 8.7	10.324	19	11 19 48.42	1.9350	0 47 3.1	11.386
20	9 49 43.06	1.9033	7 49 48.1	10.363	20	11 21 44.56	1.9365	0 58 25.1	11.398
21	9 51 37.89	1.9037	7 39 25.2	10.400	21	11 23 40.78	1.9380	1 9 47.3	11.371
22	9 53 32.70	1.9033	7 29 0.1	10.436	22	11 25 37.12	1.9396	1 21 9.6	11.373
23	9 55 27.48	1.9038	7 18 32.8	10.473	23	11 27 33.56	1.9413	1 32 32.0	11.373
24	9 57 22.24	1.9046	N. 7 8 3.4	10.508	24	11 29 30.09	1.9429	S. 1 43 54.4	11.373

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
SUNDAY 13.					TUESDAY 15.				
0	11 29 30.09	1.9429	S. 1° 43' 54.4	11.373	0	13 5 31.41	2.0745	S. 10° 33' 20.7	10.339
1	11 31 26.71	1.9446	1 55 16.8	11.373	1	13 7 35.99	2.0789	10 43 48.8	10.296
2	11 33 23.44	1.9464	2 6 39.1	11.371	2	13 9 40.79	2.0820	10 54 5.1	10.249
3	11 35 20.28	1.9482	2 18 1.3	11.368	3	13 11 45.82	2.0866	11 4 18.7	10.203
4	11 37 17.22	1.9500	2 29 23.3	11.365	4	13 13 51.08	2.0897	11 14 29.5	10.158
5	11 39 14.28	1.9519	2 40 45.1	11.362	5	13 15 56.57	2.0935	11 24 37.4	10.107
6	11 41 11.45	1.9538	2 52 6.7	11.357	6	13 18 2.30	2.0974	11 34 42.3	10.067
7	11 43 8.74	1.9556	3 3 28.0	11.352	7	13 20 8.26	2.1013	11 44 44.2	10.007
8	11 45 6.15	1.9575	3 14 48.9	11.345	8	13 22 14.45	2.1053	11 54 43.1	9.956
9	11 47 3.68	1.9593	3 26 9.4	11.337	9	13 24 20.88	2.1093	12 4 38.8	9.902
10	11 49 1.34	1.9620	3 37 29.4	11.329	10	13 26 27.56	2.1133	12 14 31.3	9.848
11	11 50 59.13	1.9642	3 48 48.9	11.321	11	13 28 34.48	2.1173	12 24 20.6	9.793
12	11 52 57.04	1.9664	4 0 7.9	11.310	12	13 30 41.64	2.1214	12 34 6.5	9.737
13	11 54 55.09	1.9687	4 11 26.2	11.299	13	13 32 49.05	2.1256	12 43 49.0	9.680
14	11 56 53.28	1.9710	4 22 43.8	11.287	14	13 34 56.70	2.1297	12 53 28.1	9.622
15	11 58 51.60	1.9733	4 34 0.7	11.275	15	13 37 4.61	2.1338	13 3 3.7	9.563
16	12 0 50.07	1.9757	4 45 16.8	11.261	16	13 39 12.76	2.1380	13 12 35.7	9.503
17	12 2 48.68	1.9781	4 56 32.0	11.247	17	13 41 21.16	2.1422	13 22 4.0	9.443
18	12 4 47.44	1.9806	5 7 46.4	11.231	18	13 43 29.82	2.1465	13 31 28.7	9.380
19	12 6 46.35	1.9831	5 18 59.8	11.215	19	13 45 38.73	2.1507	13 40 49.6	9.317
20	12 8 45.41	1.9856	5 30 12.2	11.197	20	13 47 47.90	2.1550	13 50 6.7	9.252
21	12 10 44.62	1.9882	5 41 23.5	11.180	21	13 49 57.33	2.1593	13 59 19.9	9.187
22	12 12 43.99	1.9909	5 52 33.8	11.161	22	13 52 7.02	2.1637	14 8 29.1	9.120
23	12 14 43.52	1.9936	S. 6 3 42.9	11.143	23	13 54 16.97	2.1680	S. 14 17 34.3	9.053
MONDAY 14.					WEDNESDAY 16.				
0	12 16 43.22	1.9964	S. 6 14 50.8	11.121	0	13 56 27.16	2.1724	S. 14 26 35.5	8.984
1	12 18 43.09	1.9992	6 25 57.5	11.100	1	13 58 37.61	2.1767	14 35 32.5	8.916
2	12 20 43.12	2.0020	6 37 2.8	11.077	2	14 0 48.34	2.1811	14 44 25.3	8.844
3	12 22 43.32	2.0048	6 48 6.7	11.053	3	14 2 59.34	2.1855	14 53 13.9	8.778
4	12 24 43.70	2.0078	6 59 9.2	11.028	4	14 5 10.60	2.1899	15 1 58.1	8.700
5	12 26 44.25	2.0107	7 10 10.2	11.003	5	14 7 22.13	2.1943	15 10 37.9	8.627
6	12 28 44.98	2.0137	7 21 9.6	10.977	6	14 9 33.92	2.1988	15 19 13.3	8.552
7	12 30 45.89	2.0166	7 32 7.4	10.950	7	14 11 45.98	2.2033	15 27 44.1	8.476
8	12 32 46.99	2.0199	7 43 3.6	10.923	8	14 13 58.31	2.2078	15 36 10.4	8.399
9	12 34 48.27	2.0230	7 53 58.0	10.893	9	14 16 10.91	2.2122	15 44 32.0	8.322
10	12 36 49.74	2.0261	8 4 50.7	10.863	10	14 18 23.77	2.2167	15 52 49.0	8.243
11	12 38 51.40	2.0293	8 15 41.5	10.833	11	14 20 36.91	2.2212	16 1 1.2	8.163
12	12 40 53.25	2.0326	8 26 30.5	10.800	12	14 22 50.31	2.2257	16 9 8.6	8.081
13	12 42 55.30	2.0358	8 37 17.6	10.768	13	14 25 3.99	2.2303	16 17 11.0	7.999
14	12 44 57.54	2.0392	8 48 2.6	10.733	14	14 27 17.95	2.2348	16 25 8.5	7.916
15	12 46 59.99	2.0426	8 58 45.6	10.698	15	14 29 32.17	2.2394	16 33 0.9	7.832
16	12 49 2.64	2.0459	9 9 26.4	10.662	16	14 31 46.67	2.2438	16 40 48.3	7.746
17	12 51 5.50	2.0493	9 20 5.1	10.626	17	14 34 1.43	2.2483	16 48 30.5	7.660
18	12 53 8.56	2.0528	9 30 41.5	10.588	18	14 36 16.47	2.2528	16 56 7.5	7.573
19	12 55 11.83	2.0563	9 41 15.6	10.549	19	14 38 31.77	2.2573	17 3 39.3	7.485
20	12 57 15.31	2.0598	9 51 47.4	10.509	20	14 40 47.35	2.2618	17 11 5.7	7.396
21	12 59 19.01	2.0634	9 2 16.7	10.468	21	14 43 3.19	2.2663	17 18 26.7	7.306
22	13 1 22.92	2.0671	9 12 43.6	10.426	22	14 45 19.31	2.2708	17 25 42.3	7.214
23	13 3 27.06	2.0708	9 23 7.9	10.384	23	14 47 35.09	2.2753	17 32 52.4	7.122
24	13 5 31.41	2.0745	S. 10 33 29.7	10.339	24	14 49 52.35	2.2798	S. 17 39 56.9	7.028

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 17.					SATURDAY 19.				
0	14 ^h 49 ^m 52.35	2.2798	S. 17° 39' 56.9	7.028	0	16 ^h 44 ^m 0.50	2.4898	S. 21° 11' 53.0	1.488
1	14 52 9.28	2.2843	17 46 55.8	6.933	1	16 46 28.16	2.4923	21 13 18.3	1.346
2	14 54 26.47	2.2888	17 53 48.9	6.838	2	16 48 55.97	2.4948	21 14 35.7	1.223
3	14 56 43.93	2.2933	18 0 36.3	6.743	3	16 51 23.91	2.4968	21 15 45.1	1.089
4	14 59 1.66	2.2978	18 7 17.9	6.644	4	16 53 51.99	2.4990	21 16 46.4	0.966
5	15 1 19.66	2.3022	18 13 53.6	6.546	5	16 56 20.20	2.4713	21 17 39.7	0.821
6	15 3 37.92	2.3066	18 20 23.4	6.446	6	16 58 48.54	2.4733	21 18 24.9	0.686
7	15 5 56.45	2.3110	18 26 47.1	6.346	7	17 1 17.01	2.4764	21 19 2.0	0.550
8	15 8 15.24	2.3154	18 33 4.8	6.244	8	17 3 45.59	2.4773	21 19 30.9	0.414
9	15 10 34.29	2.3198	18 39 16.4	6.142	9	17 6 14.29	2.4793	21 19 51.7	0.378
10	15 12 53.61	2.3240	18 45 21.8	6.038	10	17 8 43.10	2.4810	21 20 4.3	0.142
11	15 15 13.18	2.3283	18 51 20.9	5.933	11	17 11 12.01	2.4827	21 20 8.8	0.006
12	15 17 33.01	2.3326	18 57 13.8	5.828	12	17 13 41.02	2.4843	21 20 5.0	0.181
13	15 19 53.10	2.3369	19 3 0.3	5.723	13	17 16 10.13	2.4859	21 19 53.0	0.268
14	15 22 13.44	2.3311	19 8 40.5	5.615	14	17 18 39.33	2.4873	21 19 32.8	0.405
15	15 24 34.04	2.3454	19 14 14.1	5.507	15	17 21 8.61	2.4888	21 19 4.3	0.543
16	15 26 54.89	2.3496	19 19 41.3	5.396	16	17 23 37.8	2.4900	21 18 27.6	0.681
17	15 29 15.99	2.3537	19 25 1.9	5.289	17	17 26 7.42	2.4913	21 17 42.6	0.819
18	15 31 37.34	2.3578	19 30 16.0	5.178	18	17 28 36.94	2.4924	21 16 49.3	0.957
19	15 33 58.93	2.3619	19 35 23.4	5.067	19	17 31 6.52	2.4935	21 15 47.7	1.095
20	15 36 20.77	2.3659	19 40 24.0	4.954	20	17 33 36.16	2.4946	21 14 37.8	1.234
21	15 38 42.85	2.3700	19 45 17.8	4.840	21	17 36 5.86	2.4956	21 13 19.6	1.373
22	15 41 5.17	2.3740	19 50 4.8	4.726	22	17 38 35.62	2.4963	21 11 53.1	1.511
23	15 43 27.73	2.3779	S. 19 54 44.8	4.611	23	17 41 5.42	2.4971	S. 21 10 18.3	1.650
FRIDAY 18.					SUNDAY 20.				
0	15 45 50.52	2.3818	S. 19 59 17.9	4.495	0	17 43 35.27	2.4977	S. 21 8 35.1	1.788
1	15 48 13.54	2.3857	20 3 44.1	4.378	1	17 46 5.16	2.4984	21 6 43.7	1.927
2	15 50 36.80	2.3895	20 8 3.2	4.260	2	17 48 35.08	2.4998	21 4 43.9	2.065
3	15 53 0.29	2.3933	20 12 15.3	4.142	3	17 51 5.03	2.4993	21 2 35.9	2.203
4	15 55 24.00	2.3970	20 16 20.2	4.022	4	17 53 35.00	2.4996	21 0 19.5	2.341
5	15 57 47.94	2.4008	20 20 17.9	3.902	5	17 56 4.99	2.5000	20 57 54.8	2.480
6	16 0 12.09	2.4043	20 24 8.4	3.781	6	17 58 35.00	2.5002	20 55 21.9	2.618
7	16 2 36.46	2.4079	20 27 51.7	3.660	7	18 1 5.02	2.5004	20 52 40.7	2.756
8	16 5 1.04	2.4114	20 31 27.6	3.537	8	18 3 35.05	2.5004	20 49 51.2	2.894
9	16 7 25.83	2.4149	20 34 56.2	3.414	9	18 6 5.08	2.5004	20 46 53.4	3.032
10	16 9 50.83	2.4183	20 38 17.3	3.292	10	18 8 35.10	2.5002	20 43 47.4	3.170
11	16 12 16.03	2.4217	20 41 31.0	3.166	11	18 11 5.11	2.5001	20 40 33.1	3.307
12	16 14 41.43	2.4250	20 44 37.2	3.041	12	18 13 35.11	2.4998	20 37 10.6	3.444
13	16 17 7.03	2.4283	20 47 35.9	2.915	13	18 16 5.09	2.4996	20 33 39.9	3.580
14	16 19 32.82	2.4314	20 50 27.0	2.788	14	18 18 35.05	2.4990	20 30 1.0	3.717
15	16 21 58.80	2.4345	20 53 10.5	2.661	15	18 21 4.98	2.4986	20 26 13.9	3.853
16	16 24 24.97	2.4374	20 55 45.3	2.533	16	18 23 34.88	2.4980	20 22 18.6	3.988
17	16 26 51.31	2.4404	20 58 14.4	2.404	17	18 26 4.74	2.4974	20 18 15.2	4.124
18	16 29 17.82	2.4433	21 0 34.8	2.276	18	18 28 34.57	2.4967	20 14 3.7	4.260
19	16 31 44.52	2.4463	21 2 47.5	2.146	19	18 31 4.35	2.4960	20 9 44.0	4.396
20	16 34 11.38	2.4491	21 4 52.3	2.015	20	18 33 34.09	2.4951	20 5 16.3	4.529
21	16 36 38.41	2.4519	21 6 49.3	1.884	21	18 36 3.77	2.4943	20 0 40.5	4.663
22	16 39 5.62	2.4546	21 8 38.4	1.753	22	18 38 33.40	2.4932	19 55 56.7	4.796
23	16 41 32.99	2.4573	21 10 19.7	1.622	23	18 41 2.96	2.4923	19 51 4.9	4.930
24	16 44 0.50	2.4598	S. 21 11 53.0	1.489	24	18 43 32.46	2.4910	S. 19 46 5.1	5.063

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 21.					WEDNESDAY 23.				
0	18 43 32.46	2.4910	S. 19° 46' 51"	5.092	0	20 40 51.98	2.3944	S. 13° 24' 41.9"	10.461
1	18 46 1.89	2.4909	19 40 57.4	5.194	1	20 43 14.96	2.3916	13 14 11.6	10.548
2	18 48 31.25	2.4896	19 35 41.8	5.325	2	20 45 37.77	2.3788	13 3 36.2	10.632
3	18 51 0.53	2.4874	19 30 18.3	5.487	3	20 48 0.41	2.3760	12 52 55.7	10.716
4	18 53 29.74	2.4860	19 24 47.0	5.686	4	20 50 22.89	2.3738	12 42 10.3	10.797
5	18 55 58.86	2.4846	19 19 7.9	5.716	5	20 52 45.20	2.3705	12 31 20.0	10.878
6	18 58 27.89	2.4831	19 13 21.1	5.844	6	20 55 7.35	2.3677	12 20 24.9	10.957
7	19 0 56.83	2.4816	19 7 26.5	5.973	7	20 57 29.33	2.3650	12 9 25.0	11.037
8	19 3 25.68	2.4799	19 1 24.3	6.100	8	20 59 51.15	2.3623	11 58 20.5	11.113
9	19 5 54.43	2.4783	18 55 14.4	6.228	9	21 2 12.81	2.3606	11 47 11.4	11.189
10	19 8 23.08	2.4766	18 48 57.0	6.363	10	21 4 34.30	2.3589	11 35 57.8	11.262
11	19 10 51.63	2.4749	18 42 32.0	6.479	11	21 6 55.63	2.3542	11 24 39.8	11.336
12	19 13 20.07	2.4730	18 35 59.5	6.604	12	21 9 16.79	2.3515	11 13 17.5	11.407
13	19 15 48.39	2.4711	18 29 19.5	6.729	13	21 11 37.79	2.3487	11 1 50.9	11.478
14	19 18 16.60	2.4691	18 22 32.0	6.851	14	21 13 58.63	2.3460	10 50 20.2	11.545
15	19 20 44.69	2.4672	18 15 37.2	6.974	15	21 16 19.30	2.3433	10 38 45.4	11.613
16	19 23 12.67	2.4652	18 8 35.1	7.095	16	21 18 39.82	2.3407	10 27 6.6	11.678
17	19 25 40.52	2.4632	18 1 25.7	7.217	17	21 21 0.18	2.3380	10 15 23.9	11.743
18	19 28 8.25	2.4610	17 54 9.1	7.336	18	21 23 20.38	2.3354	10 3 37.4	11.805
19	19 30 35.85	2.4589	17 46 45.3	7.455	19	21 25 40.43	2.3328	9 51 47.1	11.868
20	19 33 3.32	2.4567	17 39 14.4	7.574	20	21 28 0.32	2.3303	9 39 53.2	11.927
21	19 35 30.66	2.4545	17 31 36.4	7.693	21	21 30 20.06	2.3277	9 27 55.7	11.987
22	19 37 57.86	2.4522	17 23 51.4	7.807	22	21 32 39.64	2.3252	9 15 54.8	12.043
23	19 40 24.93	2.4499	S. 17° 15' 59.4"	7.923	23	21 34 59.07	2.3227	S. 9° 3' 50.5"	12.100
TUESDAY 22.					THURSDAY 24.				
0	19 42 51.85	2.4475	S. 17° 8' 0.6"	8.037	0	21 37 18.36	2.3202	S. 8° 51' 42.8"	12.154
1	19 45 18.63	2.4452	16 59 54.9	8.151	1	21 39 37.50	2.3177	8 39 31.9	12.208
2	19 47 45.27	2.4428	16 51 42.5	8.263	2	21 41 56.49	2.3153	8 27 17.9	12.268
3	19 50 11.77	2.4404	16 43 23.3	8.376	3	21 44 15.33	2.3128	8 15 0.9	12.308
4	19 52 38.12	2.4379	16 34 57.4	8.486	4	21 46 34.03	2.3104	8 2 40.9	12.366
5	19 55 4.32	2.4353	16 26 24.9	8.596	5	21 48 52.59	2.3081	7 50 18.1	12.404
6	19 57 30.36	2.4328	16 17 45.9	8.704	6	21 51 11.00	2.3058	7 37 52.4	12.449
7	19 59 56.25	2.4303	16 9 0.4	8.812	7	21 53 29.27	2.3034	7 25 24.0	12.495
8	20 2 21.99	2.4277	16 0 8.5	8.917	8	21 55 47.41	2.3011	7 12 53.0	12.537
9	20 4 47.57	2.4250	15 51 10.2	9.023	9	21 58 5.41	2.2988	7 0 19.5	12.579
10	20 7 12.99	2.4224	15 42 5.7	9.126	10	22 0 23.27	2.2966	6 47 43.5	12.618
11	20 9 38.25	2.4197	15 32 55.0	9.230	11	22 2 41.00	2.2944	6 35 5.2	12.657
12	20 12 3.35	2.4171	15 23 38.1	9.331	12	22 4 58.60	2.2923	6 22 24.7	12.693
13	20 14 28.29	2.4144	15 14 15.2	9.433	13	22 7 16.07	2.2902	6 9 41.9	12.730
14	20 16 53.08	2.4118	15 4 46.2	9.532	14	22 9 33.42	2.2881	5 56 57.1	12.763
15	20 19 17.71	2.4092	14 55 11.3	9.631	15	22 11 50.64	2.2860	5 44 10.3	12.795
16	20 21 42.18	2.4065	14 45 30.5	9.727	16	22 14 7.74	2.2840	5 31 21.6	12.826
17	20 24 6.48	2.4037	14 35 43.9	9.824	17	22 16 24.71	2.2819	5 18 31.1	12.867
18	20 26 30.62	2.4010	14 25 51.6	9.918	18	22 18 41.57	2.2800	5 5 38.8	12.884
19	20 28 54.59	2.3982	14 15 53.7	10.012	19	22 20 58.31	2.2781	4 52 44.9	12.911
20	20 31 18.40	2.3954	14 5 50.2	10.103	20	22 23 14.94	2.2762	4 39 49.5	12.935
21	20 33 42.04	2.3927	13 55 41.2	10.195	21	22 25 31.45	2.2743	4 26 52.6	12.960
22	20 36 5.52	2.3899	13 45 26.8	10.284	22	22 27 47.85	2.2725	4 13 54.3	12.982
23	20 38 28.83	2.3872	13 35 7.0	10.374	23	22 30 4.14	2.2707	4 0 54.8	13.002
24	20 40 51.98	2.3844	S. 13° 24' 41.9"	10.461	24	22 32 20.33	2.2690	S. 3° 47' 54.0"	13.020

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 25.					SUNDAY 27.				
0	22 32 20.33	2.2690	S. 3° 47' 54.0	13.020	0	0 19 53.93	2.2292	N. 6° 31' 50.4	12.270
1	22 34 36.41	2.2673	3 34 52.2	13.039	1	0 22 7.50	2.2292	6 44 5.2	12.222
2	22 36 52.39	2.2654	3 21 49.3	13.064	2	0 24 21.07	2.2261	6 56 17.0	12.173
3	22 39 8.26	2.2636	3 8 45.5	13.070	3	0 26 34.63	2.2260	7 8 25.8	12.121
4	22 41 24.04	2.2622	2 55 40.9	13.062	4	0 28 48.19	2.2260	7 20 31.5	12.069
5	22 43 39.72	2.2606	2 42 35.5	13.095	5	0 31 1.75	2.2260	7 32 34.1	12.016
6	22 45 55.31	2.2591	2 29 29.5	13.104	6	0 33 15.31	2.2261	7 44 33.4	11.963
7	22 48 10.80	2.2576	2 16 22.9	13.114	7	0 35 28.87	2.2261	7 56 29.5	11.907
8	22 50 26.21	2.2566	2 3 15.8	13.121	8	0 37 42.44	2.2262	8 8 22.2	11.850
9	22 52 41.53	2.2546	1 50 8.3	13.128	9	0 39 56.01	2.2262	8 20 11.5	11.793
10	22 54 56.76	2.2532	1 37 0.5	13.132	10	0 42 9.59	2.2266	8 31 57.3	11.734
11	22 57 11.91	2.2518	1 23 52.4	13.136	11	0 44 23.18	2.2266	8 43 39.6	11.674
12	22 59 26.97	2.2504	1 10 44.2	13.137	12	0 46 36.78	2.2268	8 55 18.2	11.613
13	23 1 41.96	2.2492	0 57 35.9	13.138	13	0 48 50.39	2.2268	9 6 53.1	11.551
14	23 3 56.87	2.2480	0 44 27.7	13.136	14	0 51 4.01	2.2271	9 18 24.3	11.487
15	23 6 11.71	2.2467	0 31 19.6	13.133	15	0 53 17.64	2.2273	9 29 51.6	11.423
16	23 8 26.47	2.2456	0 18 11.7	13.128	16	0 55 31.28	2.2276	9 41 15.1	11.358
17	23 10 41.17	2.2444	S. 0 5 4.1	13.123	17	0 57 44.94	2.2278	9 52 34.6	11.292
18	23 12 55.80	2.2434	N. 0 8 3.1	13.116	18	0 59 58.61	2.2281	10 3 50.1	11.225
19	23 15 10.37	2.2423	0 21 9.8	13.108	19	1 2 12.30	2.2283	10 15 1.6	11.157
20	23 17 24.87	2.2413	0 34 16.0	13.098	20	1 4 26.01	2.2287	10 26 8.9	11.087
21	23 19 39.31	2.2402	0 47 21.6	13.087	21	1 6 39.74	2.2290	10 37 12.0	11.016
22	23 21 53.70	2.2393	1 0 26.4	13.073	22	1 8 53.49	2.2293	10 48 10.8	10.945
23	23 24 8.03	2.2383	N. 1 13 30.4	13.059	23	1 11 7.26	2.2296	N. 10 59 5.3	10.873
SATURDAY 26.					MONDAY 28.				
0	23 26 22.30	2.2375	N. 1 26 33.5	13.044	0	1 13 21.04	2.2300	N. 11 9 55.5	10.799
1	23 28 36.53	2.2367	1 39 35.7	13.028	1	1 15 34.85	2.2303	11 20 41.2	10.734
2	23 30 50.70	2.2360	1 52 36.8	13.009	2	1 17 48.68	2.2307	11 31 22.4	10.649
3	23 33 4.83	2.2350	2 5 36.8	12.989	3	1 20 2.53	2.2310	11 41 59.1	10.573
4	23 35 18.90	2.2343	2 18 35.5	12.968	4	1 22 16.40	2.2314	11 52 31.1	10.496
5	23 37 32.94	2.2336	2 31 32.9	12.946	5	1 24 30.30	2.2318	12 2 58.5	10.417
6	23 39 46.93	2.2330	2 44 29.0	12.922	6	1 26 44.22	2.2323	12 13 21.2	10.336
7	23 42 0.88	2.2323	2 57 23.6	12.897	7	1 28 58.16	2.2326	12 23 39.1	10.258
8	23 44 14.80	2.2317	3 10 16.6	12.870	8	1 31 12.13	2.2330	12 33 52.2	10.177
9	23 46 28.69	2.2311	3 23 8.0	12.843	9	1 33 26.12	2.2334	12 44 0.4	10.096
10	23 48 42.55	2.2306	3 35 57.7	12.813	10	1 35 40.14	2.2338	12 54 3.7	10.013
11	23 50 56.35	2.2300	3 48 45.6	12.783	11	1 37 54.18	2.2343	13 4 2.0	9.930
12	23 53 10.13	2.2296	4 1 31.7	12.750	12	1 40 8.25	2.2347	13 13 55.3	9.846
13	23 55 23.89	2.2291	4 14 15.8	12.717	13	1 42 22.34	2.2351	13 23 43.5	9.761
14	23 57 37.62	2.2287	4 26 57.8	12.683	14	1 44 36.46	2.2356	13 33 26.6	9.675
15	23 59 51.33	2.2283	4 39 37.8	12.648	15	1 46 50.60	2.2360	13 43 4.5	9.588
16	0 2 5.01	2.2280	4 52 15.6	12.611	16	1 49 4.77	2.2363	13 52 37.2	9.501
17	0 4 18.67	2.2276	5 4 51.2	12.573	17	1 51 18.97	2.2368	14 2 4.7	9.413
18	0 6 32.32	2.2274	5 17 24.4	12.533	18	1 53 33.19	2.2373	14 11 26.8	9.324
19	0 8 45.95	2.2271	5 29 55.2	12.493	19	1 55 47.43	2.2376	14 20 43.5	9.234
20	0 10 59.57	2.2269	5 42 23.5	12.451	20	1 58 1.70	2.2380	14 29 54.9	9.144
21	0 13 13.17	2.2267	5 54 49.3	12.408	21	2 0 16.00	2.2386	14 39 0.8	9.053
22	0 15 26.77	2.2265	6 7 12.4	12.363	22	2 2 30.32	2.2389	14 48 1.3	8.961
23	0 17 40.35	2.2263	6 19 32.8	12.317	23	2 4 44.66	2.2393	14 56 56.2	8.868
24	0 19 53.93	2.2262	N. 6 31 50.4	12.270	24	2 6 59.03	2.2396	N. 15 5 45.5	8.776

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 29.					WEDNESDAY 30.				
0	2 6 59.03	2.2206	N.15° 5' 45.5"	8.775	0	3 0 48.80	2.2446	N.18° 8' 5.4"	6.370
1	2 9 13.42	2.2400	15 14 29.2	8.682	1	3 3 3.48	2.2446	18 14 24.4	6.264
2	2 11 27.83	2.2408	15 23 7.3	8.588	2	3 5 18.15	2.2445	18 20 37.1	6.158
3	2 13 42.27	2.2407	15 31 39.7	8.493	3	3 7 32.82	2.2444	18 26 43.4	6.052
4	2 15 56.72	2.2410	15 40 6.4	8.397	4	3 9 47.48	2.2442	18 32 43.3	5.945
5	2 18 11.19	2.2413	15 48 27.3	8.300	5	3 12 2.13	2.2440	18 38 36.8	5.838
6	2 20 25.68	2.2416	15 56 42.4	8.203	6	3 14 16.77	2.2438	18 44 23.9	5.731
7	2 22 40.19	2.2420	16 4 51.7	8.106	7	3 16 31.39	2.2436	18 50 4.5	5.623
8	2 24 54.72	2.2423	16 12 55.1	8.007	8	3 18 46.00	2.2434	18 55 38.7	5.516
9	2 27 9.26	2.2426	16 20 52.6	7.908	9	3 21 0.59	2.2431	19 1 6.4	5.407
10	2 29 23.82	2.2428	16 28 44.1	7.809	10	3 23 15.17	2.2428	19 6 27.6	5.299
11	2 31 38.40	2.2431	16 36 29.7	7.709	11	3 25 29.72	2.2424	19 11 42.3	5.190
12	2 33 52.99	2.2433	16 44 9.2	7.609	12	3 27 44.24	2.2420	19 16 50.4	5.082
13	2 36 7.59	2.2435	16 51 42.7	7.508	13	3 29 58.76	2.2417	19 21 52.0	4.973
14	2 38 22.21	2.2436	16 59 10.2	7.407	14	3 32 13.25	2.2412	19 26 47.1	4.864
15	2 40 36.83	2.2438	17 6 31.6	7.305	15	3 34 27.71	2.2408	19 31 35.6	4.754
16	2 42 51.47	2.2440	17 13 46.8	7.203	16	3 36 42.15	2.2403	19 36 17.6	4.644
17	2 45 6.12	2.2442	17 20 55.9	7.100	17	3 38 56.56	2.2398	19 40 53.0	4.534
18	2 47 20.77	2.2443	17 27 58.8	6.997	18	3 41 10.93	2.2393	19 45 21.7	4.424
19	2 49 35.43	2.2444	17 34 55.6	6.894	19	3 43 25.27	2.2388	19 49 43.9	4.314
20	2 51 50.10	2.2445	17 41 46.1	6.790	20	3 45 39.58	2.2382	19 53 59.4	4.204
21	2 54 4.77	2.2446	17 48 30.3	6.686	21	3 47 53.85	2.2375	19 58 8.3	4.093
22	2 56 19.45	2.2446	17 55 8.3	6.580	22	3 50 8.08	2.2368	20 2 10.6	3.983
23	2 58 34.12	2.2446	18 1 40.0	6.476	23	3 52 22.27	2.2361	20 6 6.3	3.873
24	3 0 48.80	2.2446	N.18 8 5.4	6.370	24	3 54 36.41	2.2354	N.20 9 55.4	3.763

PHASES OF THE MOON.

☾ Last Quarter,	d	h	m.
● New Moon,	12	16	41.8
☽ First Quarter,	20	1	33.1
○ Full Moon,	26	18	1.9

☾ Apogee,	d	h
☾ Perigee,	23	20.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	<i>a</i> Aquilæ W.	85° 55' 8"	2949	87° 26' 34"	2966	88° 57' 40"	2977	90° 28' 22"	2994
	Fomalhaut W.	58 46 24	3171	60 13 8	3168	61 39 55	3187	63 6 44	3166
	<i>a</i> Pegasi W.	38 8 45	2808	39 41 7	2891	41 13 38	2886	42 46 16	2863
	Aldebaran E.	41 53 18	2650	40 13 14	2670	38 33 38	2692	36 54 32	2618
	Pollux E.	84 15 4	2687	82 35 51	2606	80 57 4	2626	79 18 43	2643
	SUN E.	131 39 32	2967	130 6 31	2886	128 33 54	2906	127 1 41	2922
2	<i>a</i> Aquilæ W.	97 56 2	3094	99 24 19	3114	100 52 11	3138	102 19 34	3160
	Fomalhaut W.	70 20 13	3188	71 46 37	3196	73 12 51	3204	74 38 55	3214
	<i>a</i> Pegasi W.	50 29 22	2898	52 1 44	2906	53 33 57	2912	55 6 0	2921
	Aldebaran E.	28 46 31	2729	27 10 30	2766	25 35 4	2782	24 0 13	2811
	Pollux E.	71 13 21	2739	69 37 33	2769	68 2 11	2777	66 27 13	2797
	SUN E.	119 26 23	3015	117 56 29	3033	116 26 57	3062	114 57 48	3069
3	<i>a</i> Aquilæ W.	109 29 43	3279	110 54 19	3306	112 18 24	3333	113 41 59	3366
	Fomalhaut W.	81 46 21	3267	83 11 11	3280	84 35 46	3292	86 0 7	3306
	<i>a</i> Pegasi W.	62 43 23	2909	64 14 15	2980	65 44 53	2990	67 15 18	3001
	<i>a</i> Arietis W.	19 18 15	3164	20 45 19	3119	22 13 5	3096	23 41 21	3077
	Pollux E.	58 38 39	2891	57 6 9	2911	55 34 4	2930	54 2 23	2949
	SUN E.	107 37 22	3166	106 10 19	3172	104 43 36	3187	103 17 11	3203
4	Fomalhaut W.	92 58 4	3372	94 20 52	3386	95 43 24	3400	97 5 40	3416
	<i>a</i> Pegasi W.	74 44 2	3064	76 13 8	3066	77 42 1	3076	79 10 41	3084
	<i>a</i> Arietis W.	31 6 20	3047	32 35 34	3047	34 4 49	3049	35 34 1	3062
	Pollux E.	46 30 1	3046	45 0 45	3068	43 31 56	3068	42 3 32	3109
	SUN E.	96 9 37	3276	94 44 56	3289	93 20 30	3301	91 56 20	3313
5	Fomalhaut W.	103 52 43	3498	105 13 15	3508	106 33 30	3526	107 53 26	3542
	<i>a</i> Pegasi W.	86 31 7	3181	87 58 39	3190	89 26 1	3148	90 53 13	3166
	<i>a</i> Arietis W.	42 59 2	3071	44 27 47	3076	45 56 26	3080	47 25 0	3084
	Pollux E.	34 48 17	3231	33 22 44	3260	31 57 46	3292	30 33 25	3326
	SUN E.	84 58 53	3369	83 36 1	3379	82 13 20	3387	80 50 49	3397
6	<i>a</i> Pegasi W.	98 6 54	3192	99 33 13	3198	100 59 24	3206	102 25 27	3211
	<i>a</i> Arietis W.	54 46 35	3104	56 14 40	3107	57 42 41	3110	59 10 39	3112
	Aldebaran W.	21 38 55	3166	23 5 57	3146	24 33 7	3143	26 0 24	3138
	Pollux E.	23 43 15	3078	22 24 17	3066	21 6 42	3047	19 50 45	3037
	SUN E.	74 0 35	3433	72 38 56	3439	71 17 24	3444	69 55 57	3449
7	<i>a</i> Pegasi W.	109 34 3	3288	110 59 27	3343	112 24 46	3347	113 49 59	3362
	<i>a</i> Arietis W.	66 29 51	3120	67 57 36	3130	69 25 21	3122	70 53 4	3121
	Aldebaran W.	33 17 59	3124	34 45 39	3123	36 13 22	3119	37 41 8	3118
	SUN E.	63 9 58	3468	61 48 57	3469	60 27 58	3471	59 7 2	3472
8	<i>a</i> Pegasi W.	120 54 40	3276	122 19 19	3282	123 43 52	3287	125 8 19	3293
	<i>a</i> Arietis W.	78 11 49	3116	79 39 39	3114	81 7 31	3113	82 35 26	3110
	Aldebaran W.	45 0 34	3106	46 28 37	3103	47 56 43	3100	49 24 53	3096
	SUN E.	52 22 36	3473	51 1 42	3474	49 40 49	3473	48 19 54	3471
9	<i>a</i> Arietis W.	89 55 51	3093	91 24 9	3089	92 52 32	3086	94 21 0	3080
	Aldebaran W.	56 46 53	3076	58 15 33	3070	59 44 19	3066	61 13 12	3060
	Pollux W.	17 33 44	3068	18 45 55	3033	20 0 23	3026	21 16 44	3034
	SUN E.	41 34 51	3461	40 13 43	3469	38 52 33	3467	37 31 19	3464
10	<i>a</i> Arietis W.	101 44 52	3066	103 13 57	3049	104 43 9	3043	106 12 29	3036

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	α Aquilæ W.	91° 58' 42"	3013	93° 28' 39"	3033	94° 58' 11"	3063	96° 27' 20"	3073
	Fomalhaut W.	64 33 34	3166	66 0 21	3172	67 27 4	3177	68 53 41	3181
	α Pegasi W.	44 18 57	2892	45 51 39	2894	47 24 18	2897	48 56 53	2892
	Aldebaran E.	35 15 55	2635	33 37 48	2657	32 0 11	2661	30 23 5	2704
	Pollux E.	77 40 47	2692	76 3 16	2692	74 26 12	2701	72 49 34	2720
	SUN E.	125 29 50	2941	123 58 27	2960	122 27 20	2978	120 56 40	2997
2	α Aquilæ W.	103 46 32	3183	105 13 2	3206	106 39 4	3230	108 4 38	3254
	Fomalhaut W.	76 4 48	3223	77 30 30	3233	78 56 0	3244	80 21 17	3255
	α Pegasi W.	56 37 52	2930	58 9 33	2939	59 41 2	2949	61 12 19	2969
	Aldebaran E.	22 26 0	2643	20 52 28	2680	19 19 43	2690	17 47 49	2695
	Pollux E.	64 52 41	2618	63 18 33	2635	61 44 51	2654	60 11 33	2678
	SUN E.	113 29 0	3087	112 0 34	3106	110 32 30	3121	109 4 46	3138
3	α Aquilæ W.	115 5 3	3396	116 27 35	3415	117 49 35	3446	119 11 0	3476
	Fomalhaut W.	87 24 13	3318	88 48 4	3331	90 11 40	3345	91 35 0	3356
	α Pegasi W.	68 45 30	3013	70 15 27	3022	71 45 12	3033	73 14 44	3044
	α Arietis W.	25 9 59	3055	26 38 52	3056	28 7 56	3061	29 37 6	3047
	Pollux E.	52 31 6	2968	51 0 13	2968	49 29 45	3006	47 59 40	3027
	SUN E.	101 51 4	3218	100 25 16	3234	98 59 47	3247	97 34 34	3261
4	Fomalhaut W.	98 27 38	3431	99 49 20	3446	101 10 45	3461	102 31 53	3477
	α Pegasi W.	80 39 10	3095	82 7 26	3104	83 35 31	3113	85 3 25	3123
	α Arietis W.	37 3 10	3056	38 32 15	3066	40 1 16	3062	41 30 12	3067
	Pollux E.	40 35 33	3131	39 8 1	3154	37 40 57	3178	36 14 21	3204
	SUN E.	90 32 23	3235	89 8 41	3236	87 45 13	3248	86 21 57	3256
5	Fomalhaut W.	109 13 4	3550	110 32 23	3576	111 51 23	3594	113 10 4	3614
	α Pegasi W.	92 20 15	3163	93 47 8	3171	95 13 52	3178	96 40 27	3186
	α Arietis W.	48 53 29	3098	50 21 53	3092	51 50 12	3096	53 18 26	3101
	Pollux E.	29 9 44	3364	27 46 46	3408	26 24 38	3456	25 3 25	3513
	SUN E.	79 28 29	3406	78 6 18	3413	76 44 16	3430	75 22 22	3426
6	α Pegasi W.	103 51 23	3216	105 17 13	3222	106 42 56	3228	108 8 32	3232
	α Arietis W.	60 38 34	3114	62 6 27	3116	63 34 17	3118	65 2 5	3119
	Aldebaran W.	27 27 48	3134	28 55 16	3133	30 22 47	3129	31 50 21	3126
	Pollux E.	18 36 42	3097	17 24 59	4168	16 16 3	4267	15 10 30	4671
	SUN E.	68 34 36	3454	67 13 20	3459	65 52 10	3461	64 31 2	3464
7	α Pegasi W.	115 15 7	3268	116 40 8	3263	118 5 4	3266	119 29 55	3271
	α Arietis W.	72 20 48	3121	73 48 32	3121	75 16 16	3119	76 44 2	3119
	Aldebaran W.	39 8 56	3116	40 36 46	3114	42 4 39	3111	43 32 35	3109
	SUN E.	57 46 7	3473	56 25 13	3475	55 4 21	3474	53 43 28	3478
8	α Pegasi W.	126 32 39	3299	127 56 52	3306	129 20 58	3311	130 44 57	3317
	α Arietis W.	84 3 24	3107	85 31 25	3104	86 59 30	3101	88 27 38	3097
	Aldebaran W.	50 53 7	3092	52 21 26	3089	53 49 49	3084	55 18 18	3079
	SUN E.	46 58 58	3470	45 38 0	3467	44 16 59	3465	42 55 56	3463
9	α Arietis W.	95 49 34	3075	97 18 14	3070	98 47 0	3065	100 15 53	3060
	Aldebaran W.	62 42 11	3064	64 11 18	3048	65 40 30	3043	67 9 50	3037
	Pollux W.	22 34 42	3569	23 54 1	3496	25 14 30	3441	26 36 0	3393
	SUN E.	36 10 3	3450	34 48 43	3448	33 27 21	3446	32 5 56	3443
10	α Arietis W.	107 41 57	3031	109 11 31	3025	110 41 13	3019	112 11 2	3014

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
10	Aldebaran W.	68° 39' 17"	3030	70° 8' 52"	3023	71° 38' 36"	3017	73° 8' 28"	3008
	Pollux W.	27 58 24	3383	29 21 34	3316	30 45 27	3284	32 9 57	3234
	Sun E.	30 44 28	3441	29 22 58	3440	28 1 27	3439	26 39 55	3430
14	Sun W.	15 41 37	3297	17 5 52	3269	18 30 51	3227	19 56 28	3198
	Antares E.	61 21 8	2779	59 46 13	2772	58 11 8	2764	56 35 53	2766
15	Sun W.	27 11 53	3097	28 40 6	3081	30 8 39	3067	31 37 29	3063
	Antares E.	48 37 8	2719	47 0 54	2713	45 24 31	2706	43 47 59	2699
	α Aquilæ E.	100 58 4	3136	99 30 26	3113	98 2 32	3101	96 34 24	3091
16	Sun W.	39 5 47	2990	40 36 12	2978	42 6 52	2967	43 37 46	2966
	Antares E.	35 43 20	2973	34 6 4	2969	32 28 43	2966	30 51 18	2966
	α Aquilæ E.	89 10 29	3042	87 41 8	3034	86 11 37	3026	84 41 57	3020
	Fomalhaut E.	116 38 53	3215	115 13 2	3190	113 46 41	3168	112 19 53	3146
17	Sun W.	51 15 41	2903	52 47 56	2892	54 20 25	2883	55 53 6	2872
	Jupiter W.	17 2 55	2710	18 39 21	2686	20 16 17	2686	21 53 42	2646
	Antares E.	22 44 19	2681	21 7 14	2686	19 30 27	2716	17 54 7	2743
	α Aquilæ E.	77 11 57	2999	75 41 43	2997	74 11 26	2996	72 41 8	2996
	Fomalhaut E.	104 59 43	3062	103 30 35	3037	102 1 8	3023	100 31 24	3009
	α Pegasi E.	124 25 7	2767	122 49 43	2743	121 14 0	2728	119 37 57	2712
18	Sun W.	63 39 50	2621	65 13 50	2611	66 48 3	2601	68 22 29	2592
	Jupiter W.	30 6 19	2676	31 45 47	2664	33 25 31	2653	35 5 31	2642
	α Aquilæ E.	65 10 1	3011	63 40 2	3018	62 10 12	3026	60 40 32	3036
	Fomalhaut E.	92 58 37	2960	91 27 21	2941	89 55 54	2931	88 24 15	2924
	α Pegasi E.	111 32 51	2643	109 54 55	2632	108 16 43	2620	106 38 15	2606
19	Sun W.	76 17 52	2742	77 53 36	2732	79 29 33	2723	81 5 42	2714
	Jupiter W.	43 29 17	2469	45 10 46	2470	46 52 29	2469	48 34 26	2460
	α Aquilæ E.	53 16 20	3194	51 48 39	3149	50 21 29	3180	48 54 56	3213
	Fomalhaut E.	80 43 47	2996	79 11 22	2993	77 38 53	2990	76 6 20	2989
	α Pegasi E.	98 22 2	2654	96 42 4	2644	95 1 52	2636	93 21 27	2626
20	Sun W.	89 9 37	2606	90 47 2	2607	92 24 39	2619	94 2 28	2629
	Jupiter W.	57 7 31	2412	58 50 48	2408	60 34 18	2394	62 18 1	2386
	Antares W.	19 31 15	3493	21 12 38	3482	22 54 45	3434	24 37 30	3413
	α Aquilæ E.	41 54 17	3474	40 33 24	3460	39 13 55	3440	37 56 4	3741
	Fomalhaut E.	68 23 45	2990	66 51 26	2996	65 19 15	2914	63 47 14	2924
	α Pegasi E.	84 56 16	2484	83 14 40	2476	81 32 53	2468	79 50 55	2462
21	Sun W.	102 14 37	2606	103 53 37	2606	105 32 49	2600	107 12 11	2672
	Jupiter W.	70 59 43	2944	72 44 39	2935	74 29 47	2926	76 15 06	2920
	Antares W.	33 18 13	2331	35 3 28	2318	36 49 1	2306	38 34 52	2296
	Fomalhaut E.	56 11 13	3089	54 41 11	3034	53 11 40	3064	51 42 46	3066
	α Pegasi E.	71 19 1	2436	69 36 17	2430	67 53 25	2436	66 10 28	2436
	α Arietis E.	114 25 40	2322	112 40 12	2311	110 54 29	2303	109 8 34	2296
22	Sun W.	115 31 32	2636	117 11 52	2632	118 52 21	2627	120 32 56	2621
	Jupiter W.	85 4 19	2396	86 50 39	2380	88 37 8	2374	90 23 46	2369
	Antares W.	47 27 51	2346	49 15 6	2342	51 2 31	2334	52 50 8	2326
	Fomalhaut E.	44 30 27	2361	43 7 14	2354	41 45 25	2346	40 25 10	2336
	α Pegasi E.	57 35 21	2636	55 52 22	2629	54 9 28	2623	52 26 41	2610

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
10	Aldebaran W.	74° 38' 29"	3002	76° 8' 39"	2996	77° 38' 58"	2998	79° 9' 26"	2990
	Pollux W.	33 35 2	3228	35 0 38	3203	36 26 44	3192	37 53 15	3160
	SUN E.	25 18 23	3440	23 56 52	3443	22 35 24	3447	21 14 1	3454
14	SUN W.	21 22 40	3173	22 49 21	3161	24 16 29	3132	25 44 0	3114
	Antares E.	55 0 28	3748	53 24 52	3741	51 49 7	3734	50 13 12	3727
15	SUN W.	33 6 36	3039	34 36 0	3026	36 5 40	3014	37 35 36	3001
	Antares E.	42 11 18	2994	40 34 30	2987	38 57 33	2983	37 20 30	2978
	α Aquilæ E.	95 6 3	3078	93 37 27	3069	92 8 39	3059	90 39 39	3051
16	SUN W.	45 8 54	2946	46 40 15	2935	48 11 50	2924	49 43 39	2913
	Antares E.	29 13 52	2964	27 36 24	2958	25 58 57	2958	24 21 34	2974
	α Aquilæ E.	83 12 9	3014	81 42 14	3010	80 12 14	3006	78 42 8	3001
	Fomalhaut E.	110 52 39	3133	109 25 0	3105	107 56 56	3087	106 28 30	3069
17	SUN W.	57 26 1	2992	58 59 9	2982	60 32 30	2942	62 6 4	2932
	Jupiter W.	23 31 32	2932	25 9 44	2916	26 48 17	2902	28 27 9	2899
	Antares E.	16 18 24	2783	14 43 34	2843	13 10 1	2931	11 38 21	3009
	α Aquilæ E.	71 10 50	2996	69 40 32	2998	68 10 17	3002	66 40 7	3006
	Fomalhaut E.	99 1 22	2996	97 31 3	2983	96 0 29	2971	94 29 40	2960
	α Pegasi E.	118 1 34	2996	116 24 51	2983	114 47 48	2970	113 10 28	2957
18	SUN W.	69 57 8	2782	71 32 0	2772	73 7 5	2763	74 42 22	2753
	Jupiter W.	36 45 46	2930	38 26 17	2920	40 7 3	2910	41 48 3	2499
	α Aquilæ E.	59 11 6	3060	57 41 55	3064	56 13 1	3081	54 44 28	3101
	Fomalhaut E.	86 52 26	2916	85 20 28	2909	83 48 21	2904	82 16 7	2899
	α Pegasi E.	104 59 31	2996	103 20 31	2966	101 41 16	2974	100 1 46	2964
19	SUN W.	82 42 3	2706	84 18 36	2696	85 55 23	2684	87 32 24	2675
	Jupiter W.	50 16 36	2450	51 59 0	2441	53 41 37	2431	55 24 27	2422
	α Aquilæ E.	47 29 2	3253	46 3 55	3296	44 39 41	3348	43 16 25	3408
	Fomalhaut E.	74 33 47	2988	73 1 13	2980	71 28 40	2961	69 56 10	2956
	α Pegasi E.	91 40 49	2917	89 59 59	2907	88 18 56	2499	86 37 41	2492
20	SUN W.	95 40 30	2630	97 18 44	2621	98 57 10	2612	100 35 48	2604
	Jupiter W.	64 1 57	2377	65 46 5	2368	67 30 25	2359	69 14 58	2351
	Antares W.	26 20 46	2393	28 4 31	2374	29 48 43	2369	31 33 17	2344
	α Aquilæ E.	36 40 0	2968	35 25 58	2996	34 14 13	4163	33 5 2	4336
	Fomalhaut E.	62 15 26	2936	60 43 53	2960	59 12 38	2966	57 41 43	2986
	α Pegasi E.	78 8 48	2456	76 26 33	2460	74 44 9	2445	73 1 38	2441
21	SUN W.	108 51 44	2556	110 31 27	2556	112 11 20	2552	113 51 21	2545
	Jupiter W.	78 0 36	2313	79 46 17	2306	81 32 8	2299	83 18 9	2293
	Antares W.	40 20 59	2286	42 7 21	2274	43 53 58	2266	45 40 48	2257
	Fomalhaut E.	50 14 32	3135	48 47 5	3178	47 20 30	3229	45 54 55	3286
	α Pegasi E.	64 27 29	2424	62 44 28	2423	61 1 26	2423	59 18 23	2423
	α Arietis E.	107 22 27	2987	105 36 8	2280	103 49 39	2272	102 2 59	2265
22	SUN W.	122 13 40	2517	123 54 30	2512	125 35 26	2508	127 16 28	2504
	Jupiter W.	92 10 31	2264	93 57 24	2259	95 44 24	2245	97 31 30	2250
	Antares W.	54 37 54	2221	56 25 50	2215	58 13 55	2210	60 2 8	2204
	Fomalhaut E.	39 6 41	3708	37 50 10	3843	36 35 52	3989	35 24 2	4158
	α Pegasi E.	50 44 3	2447	49 1 35	2487	47 19 21	2468	45 37 23	2462

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	α Arietis E.	100° 16' 8"	2256	98° 29' 7"	2252	96° 41' 57"	2246	94° 54' 38"	2241
23	Sun W.	128 57 35	2802	130 38 46	2490	132 20 1	2487	134 1 19	2486
	Jupiter W.	99 18 43	2247	101 6 1	2243	102 53 24	2240	104 40 52	2239
	Antares W.	61 50 29	2200	63 38 56	2196	65 27 29	2192	67 16 8	2190
	α Pegasi E.	43 55 45	2490	42 14 30	2619	40 33 43	2643	38 53 30	2671
	α Arietis E.	85 56 10	2218	84 8 10	2216	82 20 6	2213	80 31 58	2210
	Aldebaran E.	119 5 22	2196	117 16 49	2192	115 28 10	2186	113 39 25	2186
24	Jupiter W.	113 38 50	2223	115 26 29	2223	117 14 7	2224	119 1 44	2226
	Antares W.	76 20 17	2161	78 9 13	2180	79 58 10	2182	81 47 5	2182
	α Pegasi E.	30 44 34	2610	29 10 19	2690	27 37 47	2684	26 7 14	2680
	α Arietis E.	71 30 44	2206	69 42 28	2209	67 54 14	2211	66 6 3	2214
	Aldebaran E.	104 34 48	2178	102 45 47	2177	100 56 45	2176	99 7 44	2176
25	Antares W.	90 51 9	2194	92 39 45	2196	94 28 15	2203	96 16 38	2206
	α Aquilæ W.	43 41 50	2149	45 9 0	2092	46 37 19	2044	48 6 37	2001
	α Arietis E.	57 6 23	2286	55 18 49	2243	53 31 26	2260	51 44 13	2260
	Aldebaran E.	90 3 13	2191	88 14 32	2196	86 25 57	2199	84 37 28	2204
26	Antares W.	105 16 18	2243	107 3 42	2261	108 50 53	2260	110 37 52	2270
	α Aquilæ W.	55 44 25	2069	57 17 36	2043	58 51 10	2026	60 25 2	2016
	Fomalhaut W.	32 56 5	2447	34 0 44	2450	35 8 23	2461	36 18 43	2467
	α Arietis E.	42 51 46	2216	41 6 10	2232	39 20 57	2248	37 36 7	2266
	Aldebaran E.	75 37 16	2226	73 49 45	2247	72 2 27	2266	70 15 23	2266
	Pollux E.	117 33 48	2218	115 48 15	2228	114 2 49	2229	112 17 32	2236
27	α Aquilæ W.	68 17 7	2792	69 51 46	2792	71 26 24	2796	73 0 58	2796
	Fomalhaut W.	42 41 12	2460	44 2 21	2460	45 24 38	2447	46 47 55	2402
	α Pegasi W.	21 37 15	2664	22 55 56	2426	24 17 43	2296	25 42 0	2191
	α Arietis E.	28 59 35	2464	27 18 13	2630	25 37 42	2673	23 58 8	2621
	Aldebaran E.	61 23 42	2290	59 38 12	2232	57 52 59	2246	56 8 5	2260
	Pollux E.	103 33 57	2260	101 49 54	2261	100 6 7	2402	98 22 35	2416
28	α Aquilæ W.	80 52 7	2635	82 25 49	2647	83 59 16	2669	85 32 28	2672
	Fomalhaut W.	53 55 13	2160	55 22 11	2142	56 49 30	2129	58 17 4	2118
	α Pegasi W.	33 7 39	2606	34 39 48	2690	36 12 33	2666	37 45 45	2642
	Aldebaran E.	47 28 38	2432	45 45 49	2448	44 3 23	2466	42 21 20	2462
	Pollux E.	89 49 26	2480	88 7 45	2496	86 26 26	2510	84 45 27	2626
	Regulus E.	126 41 27	2485	124 58 42	2448	123 16 16	2462	121 34 9	2477
29	α Aquilæ W.	93 13 57	2660	94 45 13	2666	96 16 8	2666	97 46 39	2668
	Fomalhaut W.	65 37 6	2101	67 5 14	2103	68 33 20	2106	70 1 22	2110
	α Pegasi W.	45 35 34	2610	47 9 49	2611	48 44 3	2613	50 18 14	2618
	Aldebaran E.	33 57 15	2674	32 17 45	2686	30 38 43	2617	29 0 11	2640
	Pollux E.	76 26 1	2607	74 47 16	2624	73 8 54	2642	71 30 56	2709
	Regulus E.	113 8 40	2660	111 28 36	2666	109 48 54	2661	108 9 33	2667
30	α Aquilæ W.	105 12 55	2113	106 40 49	2127	108 8 14	2161	109 35 10	2186
	Fomalhaut W.	77 19 40	2149	78 46 50	2161	80 13 46	2172	81 40 29	2194
	α Pegasi W.	58 7 23	2663	59 40 42	2663	61 13 48	2673	62 46 41	2682
	Pollux E.	63 27 8	2761	61 51 36	2771	60 16 30	2790	58 41 49	2811
	Regulus E.	99 58 7	2676	98 20 53	2692	96 44 2	2707	95 7 31	2722
	Sun E.	138 51 10	2022	137 21 24	2068	135 51 58	2062	134 22 50	2069

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXh.	P. L. of Dist.
22	α Arietis E.	93° 7' 11"	2226	91° 19' 36"	2221	89° 31' 54"	2226	87° 44' 5"	2222
23	SUN W.	135 42 38	2494	137 23 59	2494	139 5 20	2494	140 46 41	2496
	Jupiter W.	106 28 23	2226	108 15 57	2225	110 3 33	2223	111 51 11	2223
	Antares W.	69 4 51	2186	70 53 39	2185	72 42 29	2183	74 31 22	2182
	α Pegasi E.	37 13 55	2604	35 35 5	2643	33 57 9	2669	32 20 15	2744
	α Arietis E.	78 43 46	2209	76 55 32	2206	75 7 17	2206	73 19 1	2207
	Aldebaran E.	111 50 36	2183	110 1 43	2181	108 12 47	2179	106 23 48	2178
24	Jupiter W.	120 49 19	2227	122 36 51	2229	124 24 20	2243	126 11 44	2247
	Antares W.	83 36 0	2184	85 24 52	2185	87 13 42	2186	89 2 28	2191
	α Pegasi E.	24 39 4	2243	23 13 46	2419	21 51 51	2640	20 34 0	2624
	α Arietis E.	64 17 56	2216	62 29 53	2220	60 41 56	2226	58 54 6	2220
	Aldebaran E.	97 18 44	2180	95 20 46	2182	93 40 51	2184	91 51 59	2186
25	Antares W.	98 4 53	2214	99 52 59	2220	101 40 56	2227	103 28 43	2226
	α Aquilæ W.	49 36 49	2664	51 7 47	2631	52 39 26	2604	54 11 40	2660
	α Arietis E.	49 57 13	2206	48 10 27	2279	46 23 56	2290	44 37 42	2202
	Aldebaran E.	82 49 7	2210	81 0 54	2216	79 12 51	2223	77 24 58	2231
26	Antares W.	112 24 36	2290	114 11 5	2290	115 57 19	2292	117 43 16	2213
	α Aquilæ W.	61 59 9	2607	63 33 28	2600	65 7 56	2796	66 42 29	2792
	Fomalhaut W.	37 31 25	2612	38 46 15	2704	40 2 58	2610	41 21 21	2630
	α Arietis E.	35 51 44	2267	34 7 50	2409	32 24 28	2433	30 41 41	2402
	Aldebaran E.	68 28 32	2275	66 41 56	2266	64 55 35	2266	63 9 30	2268
	Pollux E.	110 32 25	2244	108 47 29	2262	107 2 45	2261	105 18 14	2271
27	α Aquilæ W.	74 35 29	2603	76 9 53	2611	77 44 7	2617	79 18 13	2626
	Fomalhaut W.	48 12 4	2264	49 36 58	2261	51 2 31	2262	52 28 38	2176
	α Pegasi W.	27 8 20	2106	28 26 20	2640	30 5 43	2665	31 36 14	2643
	α Arietis E.	22 19 41	2690	20 42 34	2700	19 7 1	2638	17 33 23	2656
	Aldebaran E.	54 23 31	2273	52 39 16	2267	50 55 22	2401	49 11 49	2417
	Pollux E.	96 39 21	2426	94 56 24	2439	93 13 45	2463	91 31 26	2407
28	α Aquilæ W.	87 5 23	2667	88 37 59	2669	90 10 19	2616	91 42 19	2692
	Fomalhaut W.	59 44 52	2111	61 12 48	2106	62 40 50	2102	64 8 57	2101
	α Pegasi W.	39 19 19	2629	40 53 9	2621	42 27 10	2614	44 1 20	2611
	Aldebaran E.	40 39 41	2499	38 58 26	2617	37 17 36	2635	35 37 12	2656
	Pollux E.	83 4 50	2541	81 24 34	2656	79 44 41	2674	78 5 10	2690
	Regulus E.	119 52 23	2490	118 10 56	2606	116 29 50	2620	114 49 4	2636
29	α Aquilæ W.	99 16 45	2625	100 46 27	2647	102 15 42	2667	103 44 32	2669
	Fomalhaut W.	71 29 19	2117	72 57 8	2124	74 24 48	2132	75 52 19	2140
	α Pegasi W.	51 52 19	2623	53 26 18	2628	55 0 9	2625	56 33 52	2644
	Aldebaran E.	27 22 10	2663	25 44 40	2666	24 7 44	2716	22 31 25	2746
	Pollux E.	69 53 21	2678	68 16 11	2696	66 39 26	2714	65 3 5	2722
	Regulus E.	106 30 34	2612	104 51 55	2627	103 13 37	2643	101 35 41	2660
30	α Aquilæ W.	111 1 34	2212	112 27 29	2240	113 52 51	2268	115 17 40	2297
	Fomalhaut W.	83 6 57	2196	84 33 11	2209	85 59 10	2223	87 24 52	2237
	α Pegasi W.	64 19 21	2694	65 51 48	2696	67 24 1	2616	68 55 59	2627
	Pollux E.	57 7 35	2629	55 33 45	2648	54 0 20	2669	52 27 22	2669
	Regulus E.	93 31 22	2738	91 55 32	2754	90 20 4	2769	88 44 56	2786
	SUN E.	132 54 2	2665	131 25 34	2101	129 57 25	2117	128 29 36	2123

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.	
		Apparent Right Ascension.		Diff. for 1 hour.	Apparent Declination.		Diff. for 1 hour.				Semi-diameter.
		^h ^m ^s	^s		[°] ['] ["]	["]					
Thur.	1	12	28 38.10	9.054	S. 3 5 41.4	58.30	16 1.49	64.36	10 13.99	0.801	
Fri.	2	12	32 15.53	9.067	3 28 59.6	58.21	16 1.77	64.40	10 33.06	0.788	
Sat.	3	12	35 53.28	9.081	3 52 15.6	58.11	16 2.04	64.45	10 51.81	0.774	
Sun.	4	12	39 31.35	9.096	4 15 28.9	58.00	16 2.31	64.50	11 10.24	0.759	
Mon.	5	12	43 9.78	9.112	4 38 39.2	57.87	16 2.58	64.55	11 28.31	0.743	
Tues.	6	12	46 48.61	9.128	5 1 46.2	57.73	16 2.85	64.60	11 45.98	0.727	
Wed.	7	12	50 27.86	9.145	5 24 49.6	57.57	16 3.13	64.66	12 3.24	0.710	
Thur.	8	12	54 7.52	9.163	5 47 48.9	57.39	16 3.40	64.72	12 20.08	0.692	
Fri.	9	12	57 47.61	9.182	6 10 43.8	57.19	16 3.67	64.78	12 36.49	0.674	
Sat.	10	13	1 28.17	9.201	6 33 33.8	56.98	16 3.95	64.85	12 52.45	0.655	
Sun.	11	13	5 9.21	9.221	6 56 18.6	56.75	16 4.23	64.92	13 7.94	0.635	
Mon.	12	13	8 50.73	9.242	7 18 57.7	56.51	16 4.51	64.99	13 22.93	0.614	
Tues.	13	13	12 32.75	9.263	7 41 30.8	56.26	16 4.78	65.07	13 37.41	0.592	
Wed.	14	13	16 15.30	9.285	8 3 57.5	55.98	16 5.05	65.15	13 51.38	0.570	
Thur.	15	13	19 58.38	9.307	8 26 17.5	55.69	16 5.33	65.23	14 4.82	0.548	
Fri.	16	13	23 42.00	9.330	8 48 30.3	55.38	16 5.61	65.31	14 17.72	0.525	
Sat.	17	13	27 26.17	9.354	9 10 35.5	55.05	16 5.89	65.40	14 30.06	0.501	
Sun.	18	13	31 10.93	9.379	9 32 32.7	54.71	16 6.16	65.49	14 41.82	0.477	
Mon.	19	13	34 56.28	9.404	9 54 21.5	54.35	16 6.43	65.58	14 52.99	0.452	
Tues.	20	13	38 42.24	9.430	10 16 1.5	53.98	16 6.71	65.67	15 3.55	0.426	
Wed.	21	13	42 28.83	9.456	10 37 32.4	53.59	16 6.99	65.76	15 13.49	0.400	
Thur.	22	13	46 16.06	9.483	10 58 53.9	53.19	16 7.27	65.86	15 22.79	0.373	
Fri.	23	13	50 3.93	9.511	11 20 5.5	52.77	16 7.54	65.96	15 31.44	0.345	
Sat.	24	13	53 52.48	9.539	11 41 6.7	52.33	16 7.81	66.06	15 39.41	0.317	
Sun.	25	13	57 41.72	9.568	12 1 57.2	51.88	16 8.08	66.16	15 46.70	0.288	
Mon.	26	14	1 31.68	9.598	12 22 36.7	51.41	16 8.35	66.27	15 53.28	0.258	
Tues.	27	14	5 22.38	9.629	12 43 4.8	50.92	16 8.61	66.38	15 59.13	0.227	
Wed.	28	14	9 13.81	9.660	13 3 21.1	50.42	16 8.86	66.49	16 4.24	0.196	
Thur.	29	14	13 5.99	9.692	13 23 25.1	49.90	16 9.11	66.60	16 8.60	0.165	
Fri.	30	14	16 58.95	9.724	13 43 16.5	49.37	16 9.36	66.71	16 12.19	0.133	
Sat.	31	14	20 52.70	9.757	14 2 54.9	48.82	16 9.61	66.82	16 14.99	0.100	
Sun.	32	14	24 47.26	9.791	S. 14 22 19.9	48.25	16 9.86	66.93	16 16.98	0.066	

Nora. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time.					
		Apparent Right Ascension.		Diff. for 1 hour.	Apparent Declination.		Diff. for 1 hour.								
		^h ^m ^s	^s		[°] ['] ["]	^s									
Thur.	1	12	28	39.65	9.054	S. 3	5	51.4	58.30	10	14.12	0.801	12	38	53.77
Fri.	2	12	32	17.13	9.067	3	29	9.9	58.21	10	33.19	0.788	12	42	50.32
Sat.	3	12	35	54.93	9.081	3	52	26.2	58.11	10	51.95	0.774	12	46	46.88
Sun.	4	12	39	33.05	9.096	4	15	39.8	58.00	11	10.38	0.759	12	50	43.43
Mon.	5	12	43	11.53	9.112	4	38	50.4	57.87	11	28.45	0.743	12	54	39.98
Tue.	6	12	46	50.41	9.128	5	1	57.6	57.73	11	46.12	0.727	12	58	36.53
Wed.	7	12	50	29.70	9.145	5	25	1.2	57.57	12	3.38	0.710	13	2	33.08
Thur.	8	12	54	9.41	9.163	5	48	0.7	57.39	12	20.22	0.692	13	6	29.63
Fri.	9	12	57	49.55	9.182	6	10	55.8	57.19	12	36.64	0.674	13	10	26.19
Sat.	10	13	1	30.15	9.201	6	33	46.0	56.98	12	52.59	0.655	13	14	22.74
Sun.	11	13	5	11.23	9.221	6	56	31.0	56.75	13	8.07	0.635	13	18	19.30
Mon.	12	13	8	52.79	9.242	7	19	10.3	56.51	13	23.06	0.614	13	22	15.85
Tues.	13	13	12	34.85	9.263	7	41	43.6	56.26	13	37.55	0.592	13	26	12.40
Wed.	14	13	16	17.44	9.285	8	4	10.5	55.98	13	51.51	0.570	13	30	8.95
Thur.	15	13	20	0.56	9.307	8	26	30.6	55.69	14	4.95	0.548	13	34	5.51
Fri.	16	13	23	44.22	9.330	8	48	43.5	55.38	14	17.84	0.525	13	38	2.06
Sat.	17	13	27	28.43	9.354	9	10	48.8	55.05	14	30.18	0.501	13	41	58.61
Sun.	18	13	31	13.23	9.379	9	32	46.1	54.71	14	41.94	0.477	13	45	55.17
Mon.	19	13	44	58.61	9.404	9	54	35.0	54.35	14	53.11	0.452	13	49	51.72
Tues.	20	13	38	44.61	9.430	10	16	15.1	53.98	15	3.66	0.426	13	53	48.27
Wed.	21	13	42	31.23	9.456	10	37	46.1	53.59	15	13.59	0.400	13	57	44.82
Thur.	22	13	46	18.49	9.483	10	59	7.6	53.19	15	22.89	0.373	14	1	41.38
Fri.	23	13	50	6.39	9.511	11	20	19.2	52.77	15	31.54	0.345	14	5	37.93
Sat.	24	13	53	54.97	9.539	11	41	20.4	52.33	15	39.51	0.317	14	9	34.48
Sun.	25	13	57	44.24	9.568	12	2	10.9	51.88	15	46.80	0.288	14	13	31.04
Mon.	26	14	1	34.23	9.598	12	22	50.4	51.41	15	53.36	0.258	14	17	27.59
Tues.	27	14	5	24.95	9.629	12	43	18.4	50.92	15	59.20	0.227	14	21	24.15
Wed.	28	14	9	16.40	9.660	13	3	34.6	50.42	16	4.30	0.196	14	25	20.70
Thur.	29	14	13	8.60	9.692	13	23	38.5	49.90	16	8.65	0.165	14	29	17.25
Fri.	30	14	17	1.58	9.724	13	43	29.8	49.37	16	12.23	0.133	14	33	13.81
Sat.	31	14	20	55.35	9.757	14	3	8.1	48.82	16	15.01	0.100	14	37	10.36
Sun.	32	14	24	49.92	9.791	S. 14	22	33.0	48.25	16	17.00	0.066	14	41	6.92

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	274	187° 48' 30.7	47' 38.3	147.63	+0.39	0.0002212	51.2	11 19 14.65	
2	275	188 47 34.8	46 42.3	147.73	0.26	0.0000983	51.1	11 15 18.74	
3	276	189 46 41.3	45 48.7	147.82	0.13	9.9999757	51.1	11 11 22.83	
4	277	190 45 50.1	44 57.4	147.92	+0.02	.9998532	51.1	11 7 26.92	
5	278	191 45 1.3	44 8.5	148.01	—0.07	.9997306	51.1	11 3 31.02	
6	279	192 44 14.9	43 22.0	148.11	0.15	.9996079	51.1	10 59 35.12	
7	280	193 43 30.7	42 37.7	148.20	0.19	.9994851	51.2	10 55 39.21	
8	281	194 42 48.8	41 55.7	148.30	0.19	.9993621	51.3	10 51 43.30	
9	282	195 42 9.2	41 16.0	148.39	0.17	.9992388	51.4	10 47 47.39	
10	283	196 41 31.8	40 38.5	148.49	0.13	.9991152	51.6	10 43 51.48	
11	284	197 41 56.5	40 3.1	148.58	—0.05	.9989912	51.7	10 39 55.58	
12	285	198 40 23.3	39 29.8	148.66	+0.04	.9988670	51.8	10 35 59.67	
13	286	199 39 52.3	38 58.7	148.74	0.16	.9987424	51.9	10 32 3.76	
14	287	200 39 23.3	38 29.6	148.82	0.29	.9986176	52.0	10 28 7.85	
15	288	201 38 56.2	38 2.4	148.90	0.42	.9984925	52.1	10 24 11.95	
16	289	202 38 30.9	37 37.0	148.98	0.55	.9983673	52.1	10 20 16.05	
17	290	203 38 7.4	37 13.4	149.06	0.68	.9982422	52.1	10 16 20.14	
18	291	204 37 45.8	36 51.7	149.14	0.79	.9981170	52.0	10 12 24.23	
19	292	205 37 25.9	36 31.7	149.21	0.87	.9979923	51.8	10 8 28.32	
20	293	206 37 7.6	36 13.3	149.28	0.95	.9978680	51.6	10 4 32.41	
21	294	207 36 51.1	35 56.7	149.35	0.99	.9977444	51.3	10 0 36.51	
22	295	208 36 36.3	35 41.8	149.42	0.98	.9976217	50.9	9 56 40.60	
23	296	209 36 23.3	35 28.7	149.49	0.96	.9974999	50.5	9 52 44.69	
24	297	210 36 11.9	35 17.2	149.56	0.92	.9973792	50.0	9 48 48.78	
25	298	211 36 2.4	35 7.6	149.64	0.86	.9972597	49.5	9 44 52.87	
26	299	212 35 54.7	34 59.8	149.72	0.74	.9971415	48.9	9 40 56.97	
27	300	213 35 48.9	34 53.9	149.80	0.62	.9970247	48.3	9 37 1.06	
28	301	214 35 45.1	34 50.0	149.88	0.50	.9969093	47.7	9 33 5.15	
29	302	215 35 43.3	34 48.1	149.96	0.37	.9967954	47.1	9 29 9.24	
30	303	216 35 43.4	34 48.1	150.05	0.23	.9966829	46.6	9 25 13.33	
31	304	217 35 45.6	34 50.2	150.13	0.13	.9965718	46.0	9 21 17.43	
32	305	218 35 49.9	34 54.3	150.22	+0.04	9.9964621	45.4	9 17 21.52	

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.	<div><div>h</div><div>m</div></div>	Diff. for 1 hour.	
1	15 18.0	15 12.3	56 2.5	-1.80	55 41.6	-1.68	15 48.3	2.12	18.3
2	15 7.1	15 2.4	55 22.5	1.52	55 5.3	1.35	16 38.9	2.08	19.3
3	14 58.3	14 54.9	54 50.3	1.15	54 37.7	0.94	17 28.1	2.01	20.3
4	14 52.2	14 50.2	54 27.6	0.74	54 20.0	0.52	18 15.7	1.94	21.3
5	14 48.8	14 48.1	54 15.1	-0.30	54 12.8	-0.09	19 1.7	1.87	22.3
6	14 48.2	14 48.9	54 13.0	+0.13	54 15.7	+0.33	19 46.2	1.83	23.3
7	14 50.3	14 52.3	54 20.8	0.53	54 28.2	0.71	20 29.8	1.80	24.3
8	14 54.9	14 58.0	54 37.7	0.88	54 49.0	1.02	21 13.0	1.80	25.3
9	15 1.6	15 5.5	55 2.0	1.15	55 16.4	1.25	21 56.5	1.83	26.3
10	15 9.7	15 14.2	55 32.0	1.33	55 48.4	1.39	22 41.1	1.89	27.3
11	15 18.8	15 23.5	56 5.3	1.42	56 22.5	1.44	23 27.5	1.98	28.3
12	15 28.1	15 32.8	56 39.7	1.43	56 56.7	1.40	6		29.3
13	15 37.3	15 41.6	57 13.2	1.35	57 29.0	1.29	0 16.3	2.09	0.7
14	15 45.7	15 49.5	57 44.0	1.20	57 58.0	1.11	1 8.0	2.22	1.7
15	15 53.0	15 56.2	58 10.9	1.03	58 22.6	0.93	2 2.5	2.33	2.7
16	15 59.0	16 1.6	58 33.2	0.83	58 42.6	0.73	2 59.4	2.41	3.7
17	16 3.8	16 5.8	58 50.8	0.64	58 57.9	0.55	3 57.5	2.42	4.7
18	16 7.4	16 8.7	59 3.9	0.46	59 8.8	0.37	4 55.5	2.39	5.7
19	16 9.8	16 10.5	59 12.6	0.28	59 15.3	+0.18	5 52.2	2.32	6.7
20	16 10.9	16 11.0	59 16.9	+0.08	59 17.3	-0.03	6 47.0	2.23	7.7
21	16 10.8	16 10.2	59 16.3	-0.13	59 14.0	0.26	7 39.8	2.16	8.7
22	16 9.1	16 7.6	59 10.2	0.38	59 4.8	0.52	8 31.1	2.11	9.7
23	16 5.7	16 3.3	58 57.7	0.66	58 48.9	0.81	9 21.4	2.09	10.7
24	16 0.4	15 57.1	58 38.3	0.95	58 26.0	1.09	10 11.6	2.09	11.7
25	15 53.3	15 49.1	58 12.1	1.22	57 56.7	1.34	11 2.1	2.12	12.7
26	15 44.5	15 39.7	57 39.9	1.44	57 22.1	1.52	11 53.3	2.15	13.7
27	15 34.7	15 29.5	57 3.6	1.57	56 44.5	1.60	12 45.2	2.17	14.7
28	15 24.3	15 19.1	56 25.4	1.59	56 6.4	1.57	13 37.2	2.17	15.7
29	15 14.0	15 9.2	55 47.9	1.51	55 30.2	1.43	14 28.8	2.13	16.7
30	15 4.7	15 0.7	55 13.7	1.31	54 58.8	1.18	15 19.3	2.07	17.7
31	14 57.1	14 54.0	54 45.6	1.02	54 34.4	0.85	16 8.1	1.99	18.7
32	14 51.6	14 49.8	54 25.5	-0.65	54 18.9	-0.44	16 54.9	1.91	19.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 1.					SATURDAY 3.				
0	3 54 36.41	2.2354	N.20° 9' 55.4	3.763	0	5 40 23.17	2.1697	N.21° 4' 49.2	1.409
1	3 56 50.51	2.2346	20 13 37.9	3.663	1	5 42 32.68	2.1674	21 3 22.0	1.504
2	3 59 4.56	2.2338	20 17 13.7	3.543	2	5 44 42.06	2.1650	21 1 48.7	1.608
3	4 1 18.56	2.2329	20 20 42.9	3.432	3	5 46 51.29	2.1627	21 0 9.4	1.706
4	4 3 32.51	2.2320	20 24 5.5	3.322	4	5 49 0.39	2.1603	20 58 24.0	1.808
5	4 5 46.40	2.2311	20 27 21.5	3.211	5	5 51 9.34	2.1580	20 56 32.6	1.908
6	4 8 0.24	2.2301	20 30 30.8	3.101	6	5 53 18.15	2.1556	20 54 35.3	2.006
7	4 10 14.02	2.2292	20 33 33.5	2.990	7	5 55 26.82	2.1533	20 52 32.0	2.106
8	4 12 27.74	2.2281	20 36 29.6	2.880	8	5 57 35.34	2.1509	20 50 22.7	2.204
9	4 14 41.39	2.2270	20 39 19.1	2.770	9	5 59 43.72	2.1484	20 48 7.5	2.302
10	4 16 54.98	2.2259	20 42 2.0	2.660	10	6 1 51.95	2.1459	20 45 46.5	2.399
11	4 19 8.50	2.2248	20 44 38.3	2.549	11	6 4 0.03	2.1434	20 43 19.6	2.497
12	4 21 21.96	2.2236	20 47 7.9	2.439	12	6 6 7.96	2.1409	20 40 46.9	2.593
13	4 23 35.34	2.2224	20 49 30.9	2.328	13	6 8 15.74	2.1383	20 38 8.4	2.689
14	4 25 48.65	2.2212	20 51 47.3	2.218	14	6 10 23.36	2.1358	20 35 24.2	2.786
15	4 28 1.88	2.2199	20 53 57.1	2.108	15	6 12 30.83	2.1333	20 32 34.2	2.881
16	4 30 15.04	2.2186	20 56 0.3	1.998	16	6 14 38.15	2.1307	20 29 38.5	2.976
17	4 32 28.12	2.2173	20 57 56.9	1.889	17	6 16 45.32	2.1182	20 26 37.1	3.071
18	4 34 41.11	2.2159	20 59 47.0	1.780	18	6 18 52.33	2.1156	20 23 30.0	3.164
19	4 36 54.02	2.2146	21 1 30.5	1.670	19	6 20 59.19	2.1130	20 20 17.3	3.268
20	4 39 6.85	2.2130	21 3 7.4	1.561	20	6 23 5.89	2.1104	20 16 59.0	3.361
21	4 41 19.58	2.2115	21 4 37.8	1.452	21	6 25 12.44	2.1078	20 13 35.1	3.448
22	4 43 32.23	2.2100	21 6 1.6	1.343	22	6 27 18.83	2.1052	20 10 5.6	3.537
23	4 45 44.79	2.2085	N.21 7 18.9	1.233	23	6 29 25.07	2.1027	N.20 6 30.6	3.629
FRIDAY 2.					SUNDAY 4.				
0	4 47 57.25	2.2069	N.21 8 29.6	1.126	0	6 31 31.15	2.1000	N.20 2 50.1	3.720
1	4 50 9.61	2.2052	21 9 33.8	1.017	1	6 33 37.07	2.0973	19 59 4.1	3.813
2	4 52 21.88	2.2036	21 10 31.6	0.909	2	6 35 42.83	2.0946	19 55 12.7	3.903
3	4 54 34.05	2.2019	21 11 22.9	0.801	3	6 37 48.43	2.0920	19 51 15.8	3.993
4	4 56 46.11	2.2001	21 12 7.7	0.694	4	6 39 53.87	2.0893	19 47 13.6	4.082
5	4 58 58.07	2.1984	21 12 46.1	0.586	5	6 41 59.15	2.0867	19 43 6.0	4.171
6	5 1 9.92	2.1967	21 13 18.0	0.479	6	6 44 4.28	2.0841	19 38 53.1	4.260
7	5 3 21.67	2.1949	21 13 43.5	0.371	7	6 46 9.24	2.0814	19 34 34.8	4.349
8	5 5 33.31	2.1930	21 14 2.5	0.263	8	6 48 14.05	2.0788	19 30 11.3	4.436
9	5 7 44.84	2.1912	21 14 15.1	0.156	9	6 50 18.70	2.0762	19 25 42.5	4.523
10	5 9 56.25	2.1892	21 14 21.4	0.049	10	6 52 23.19	2.0736	19 21 8.6	4.609
11	5 12 7.55	2.1873	21 14 21.3	0.042	11	6 54 27.52	2.0708	19 16 29.4	4.696
12	5 14 18.73	2.1853	21 14 14.8	0.161	12	6 56 31.69	2.0682	19 11 45.1	4.781
13	5 16 29.79	2.1833	21 14 2.0	0.266	13	6 58 35.70	2.0656	19 6 55.7	4.866
14	5 18 40.73	2.1813	21 13 42.9	0.371	14	7 0 39.55	2.0629	19 2 1.2	4.960
15	5 20 51.55	2.1793	21 13 17.5	0.475	15	7 2 43.24	2.0602	18 57 1.6	5.036
16	5 23 2.25	2.1772	21 12 45.9	0.579	16	7 4 46.77	2.0576	18 51 57.0	5.118
17	5 25 12.82	2.1751	21 12 8.0	0.684	17	7 6 50.14	2.0549	18 46 47.4	5.209
18	5 27 23.26	2.1729	21 11 23.8	0.787	18	7 8 53.36	2.0523	18 41 32.8	5.294
19	5 29 33.57	2.1708	21 10 33.4	0.891	19	7 10 56.42	2.0497	18 36 13.3	5.386
20	5 31 43.76	2.1686	21 9 36.9	0.994	20	7 12 59.32	2.0471	18 30 48.9	5.477
21	5 33 53.81	2.1664	21 8 34.2	1.097	21	7 15 2.06	2.0444	18 25 19.6	5.579
22	5 36 3.73	2.1642	21 7 25.3	1.199	22	7 17 4.65	2.0417	18 19 45.4	5.689
23	5 38 13.52	2.1620	21 6 10.3	1.301	23	7 19 7.09	2.0393	18 14 6.4	5.800
24	5 40 23.17	2.1597	N.21 4 49.2	1.402	24	7 21 9.37	2.0368	N.18 8 22.6	5.909

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 5.					WEDNESDAY 7.				
0	7 21 9.37	2.0808	N.18 8 22.6	6.789	0	8 56 17.04	1.9364	N.12 9 40.7	6.973
1	7 23 11.50	2.0843	18 2 34.1	6.848	1	8 58 13.18	1.9380	12 0 40.7	6.997
2	7 25 13.47	2.0817	17 56 40.8	6.926	2	9 0 9.24	1.9387	11 51 37.5	6.960
3	7 27 15.29	2.0291	17 50 42.8	6.006	3	9 2 5.21	1.9323	11 42 31.2	6.193
4	7 29 16.96	2.0266	17 44 40.2	6.082	4	9 4 1.11	1.9311	11 33 21.7	6.184
5	7 31 18.47	2.0240	17 38 32.9	6.160	5	9 5 56.93	1.9299	11 24 9.1	6.326
6	7 33 19.84	2.0216	17 32 21.0	6.236	6	9 7 52.68	1.9287	11 14 53.4	6.386
7	7 35 21.05	2.0190	17 26 4.6	6.312	7	9 9 48.36	1.9274	11 5 34.7	6.387
8	7 37 22.12	2.0166	17 19 43.6	6.387	8	9 11 43.97	1.9263	10 56 13.0	6.366
9	7 39 23.03	2.0140	17 13 18.1	6.463	9	9 13 39.51	1.9252	10 46 48.3	6.436
10	7 41 23.80	2.0116	17 6 48.1	6.537	10	9 15 34.99	1.9242	10 37 20.7	6.484
11	7 43 24.42	2.0092	17 0 13.7	6.611	11	9 17 30.41	1.9232	10 27 50.1	6.533
12	7 45 24.90	2.0068	16 53 34.8	6.684	12	9 19 25.77	1.9222	10 18 16.7	6.590
13	7 47 25.24	2.0044	16 46 51.5	6.758	13	9 21 21.07	1.9212	10 8 40.5	6.638
14	7 49 25.43	2.0020	16 40 3.9	6.829	14	9 23 16.32	1.9203	9 59 1.4	6.674
15	7 51 25.48	1.9997	16 33 12.0	6.901	15	9 25 11.51	1.9194	9 49 19.6	6.730
16	7 53 25.29	1.9974	16 26 15.8	6.973	16	9 27 6.65	1.9186	9 39 35.0	6.764
17	7 55 25.16	1.9950	16 19 15.3	7.043	17	9 29 1.74	1.9178	9 29 47.8	6.809
18	7 57 24.79	1.9927	16 12 10.6	7.113	18	9 30 56.79	1.9171	9 19 57.9	6.853
19	7 59 24.29	1.9906	16 5 1.7	7.183	19	9 32 51.79	1.9164	9 10 5.4	6.898
20	8 1 23.65	1.9883	15 57 48.6	7.253	20	9 34 46.76	1.9158	9 0 10.2	6.941
21	8 3 22.68	1.9860	15 50 31.4	7.321	21	9 36 41.69	1.9152	8 50 12.5	6.983
22	8 5 21.97	1.9838	15 43 10.1	7.388	22	9 38 36.58	1.9146	8 40 12.3	10.026
23	8 7 20.93	1.9816	N.15 35 44.7	7.457	23	9 40 31.44	1.9140	N. 8 30 9.6	10.066
TUESDAY 6.					THURSDAY 8.				
0	8 9 19.76	1.9784	N.15 28 15.3	7.524	0	9 42 26.26	1.9136	N. 8 20 4.4	10.106
1	8 11 18.46	1.9778	15 20 41.8	7.591	1	9 44 21.06	1.9131	8 9 56.8	10.147
2	8 13 17.04	1.9763	15 13 4.4	7.656	2	9 46 15.83	1.9128	7 59 46.8	10.186
3	8 15 15.49	1.9732	15 5 23.1	7.721	3	9 48 10.58	1.9124	7 49 34.5	10.225
4	8 17 13.82	1.9712	14 57 37.9	7.786	4	9 50 5.32	1.9121	7 39 19.8	10.263
5	8 19 12.02	1.9691	14 49 48.8	7.851	5	9 52 0.04	1.9118	7 29 2.8	10.302
6	8 21 10.11	1.9671	14 41 55.8	7.914	6	9 53 54.74	1.9116	7 18 43.6	10.338
7	8 23 8.07	1.9651	14 33 59.0	7.978	7	9 55 49.42	1.9113	7 8 22.2	10.375
8	8 25 5.92	1.9632	14 25 58.4	8.041	8	9 57 44.10	1.9113	6 57 58.6	10.411
9	8 27 3.65	1.9613	14 17 54.1	8.103	9	9 59 38.77	1.9112	6 47 32.9	10.447
10	8 29 1.37	1.9594	14 9 46.0	8.166	10	10 1 33.44	1.9112	6 37 5.0	10.481
11	8 30 58.77	1.9576	14 1 34.2	8.227	11	10 3 28.11	1.9113	6 26 35.1	10.515
12	8 32 56.17	1.9557	13 53 18.8	8.287	12	10 5 22.78	1.9113	6 16 3.2	10.548
13	8 34 53.46	1.9539	13 44 59.8	8.347	13	10 7 17.45	1.9113	6 5 29.3	10.582
14	8 36 50.64	1.9522	13 36 37.2	8.406	14	10 9 12.13	1.9114	5 54 53.4	10.613
15	8 38 47.72	1.9504	13 28 11.1	8.465	15	10 11 6.81	1.9115	5 44 15.6	10.644
16	8 40 44.69	1.9487	13 19 41.4	8.523	16	10 13 1.51	1.9118	5 33 36.0	10.676
17	8 42 41.56	1.9470	13 11 8.2	8.582	17	10 14 56.23	1.9131	5 22 54.5	10.707
18	8 44 38.33	1.9455	13 2 31.6	8.639	18	10 16 50.96	1.9136	5 12 11.2	10.736
19	8 46 35.01	1.9439	12 53 51.5	8.697	19	10 18 45.71	1.9138	5 1 26.1	10.766
20	8 48 31.60	1.9424	12 45 8.0	8.753	20	10 20 40.49	1.9132	4 50 39.3	10.794
21	8 50 28.10	1.9408	12 36 21.2	8.808	21	10 22 35.30	1.9137	4 39 50.8	10.822
22	8 52 24.50	1.9393	12 27 31.0	8.864	22	10 24 30.13	1.9142	4 29 0.7	10.849
23	8 54 20.81	1.9378	12 18 37.5	8.919	23	10 26 24.99	1.9147	4 18 8.9	10.876
24	8 56 17.04	1.9364	N.12 9 40.7	8.973	24	10 28 19.89	1.9153	N. 4 7 15.6	10.901

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 9.					SUNDAY 11.				
0	10 28 19.89	1.9183	N. 4° 7' 15.6"	10.901	0	12 1 51.73	2.0004	S. 4 51' 59.8"	11.386
1	10 30 14.83	1.9169	3 56 20.7	10.937	1	12 3 51.84	2.0033	5 3 15.4	11.363
2	10 32 9.80	1.9166	3 45 24.4	10.960	2	12 5 52.12	2.0068	5 14 30.2	11.339
3	10 34 4.82	1.9173	3 34 26.7	10.974	3	12 7 52.58	2.0098	5 25 44.2	11.325
4	10 35 59.88	1.9181	3 23 27.5	10.997	4	12 9 53.23	2.0128	5 36 57.2	11.309
5	10 37 54.99	1.9190	3 12 27.0	11.020	5	12 11 54.06	2.0154	5 48 9.3	11.198
6	10 39 50.16	1.9198	3 1 25.1	11.042	6	12 13 55.08	2.0186	5 59 20.3	11.175
7	10 41 45.38	1.9207	2 50 22.0	11.063	7	12 15 56.29	2.0218	6 10 30.3	11.167
8	10 43 40.65	1.9218	2 39 17.6	11.083	8	12 17 57.69	2.0251	6 21 39.1	11.137
9	10 45 35.98	1.9228	2 28 12.0	11.103	9	12 19 59.29	2.0283	6 32 46.7	11.117
10	10 47 31.38	1.9239	2 17 5.3	11.121	10	12 22 1.08	2.0317	6 43 53.1	11.097
11	10 49 26.84	1.9249	2 5 57.5	11.139	11	12 24 3.08	2.0350	6 54 58.2	11.073
12	10 51 22.37	1.9261	1 54 48.6	11.156	12	12 26 5.28	2.0384	7 6 1.9	11.049
13	10 53 17.97	1.9273	1 43 38.6	11.173	13	12 28 7.69	2.0418	7 17 4.1	11.026
14	10 55 13.64	1.9285	1 32 27.7	11.191	14	12 30 10.30	2.0453	7 28 4.9	10.999
15	10 57 9.40	1.9299	1 21 15.9	11.206	15	12 32 13.13	2.0489	7 39 4.1	10.973
16	10 59 5.23	1.9314	1 10 3.1	11.220	16	12 34 16.17	2.0525	7 50 1.7	10.946
17	11 1 1.15	1.9328	0 58 49.5	11.234	17	12 36 19.43	2.0561	8 0 57.6	10.917
18	11 2 57.16	1.9343	0 47 35.0	11.247	18	12 38 22.90	2.0598	8 11 51.8	10.887
19	11 4 53.26	1.9358	0 36 19.8	11.259	19	12 40 26.60	2.0635	8 22 44.2	10.857
20	11 6 49.45	1.9374	0 25 3.9	11.270	20	12 42 30.52	2.0673	8 33 34.7	10.826
21	11 8 45.74	1.9389	0 13 47.3	11.282	21	12 44 34.67	2.0710	8 44 23.3	10.793
22	11 10 42.12	1.9406	N. 0 2 30.1	11.292	22	12 46 39.04	2.0748	8 55 9.9	10.760
23	11 12 38.59	1.9422	S. 0 8 47.7	11.302	23	12 48 43.64	2.0786	S. 9 5 54.4	10.734
SATURDAY 10.					MONDAY 12.				
0	11 14 35.16	1.9440	S. 0 20 6.1	11.310	0	12 50 48.47	2.0825	S. 9 16 36.8	10.699
1	11 16 31.85	1.9458	0 31 24.9	11.318	1	12 52 53.54	2.0864	9 27 17.1	10.663
2	11 18 28.65	1.9477	0 42 44.2	11.324	2	12 54 58.84	2.0904	9 37 55.1	10.614
3	11 20 25.56	1.9496	0 54 3.9	11.331	3	12 57 4.38	2.0943	9 48 30.8	10.575
4	11 22 22.59	1.9515	1 5 23.9	11.336	4	12 59 10.16	2.0983	9 59 4.1	10.536
5	11 24 19.73	1.9534	1 16 44.2	11.341	5	13 1 16.18	2.1024	10 9 35.0	10.494
6	11 26 17.00	1.9555	1 28 4.8	11.344	6	13 3 22.45	2.1066	10 20 3.4	10.451
7	11 28 14.39	1.9576	1 39 25.5	11.347	7	13 5 28.96	2.1106	10 30 29.2	10.408
8	11 30 11.91	1.9598	1 50 46.4	11.348	8	13 7 35.72	2.1148	10 40 52.4	10.363
9	11 32 9.55	1.9619	2 2 7.4	11.350	9	13 9 42.73	2.1189	10 51 12.9	10.318
10	11 34 7.33	1.9643	2 13 28.4	11.350	10	13 11 49.99	2.1231	11 1 30.6	10.271
11	11 36 5.25	1.9664	2 24 49.4	11.350	11	13 13 57.50	2.1273	11 11 45.5	10.223
12	11 38 3.30	1.9688	2 36 10.4	11.349	12	13 16 5.27	2.1316	11 21 57.4	10.174
13	11 40 1.49	1.9711	2 47 31.3	11.347	13	13 18 13.30	2.1359	11 32 6.4	10.126
14	11 41 59.83	1.9736	2 58 52.0	11.344	14	13 20 21.58	2.1402	11 42 12.4	10.073
15	11 43 58.32	1.9760	3 10 12.6	11.341	15	13 22 30.12	2.1446	11 52 15.2	10.021
16	11 45 56.95	1.9786	3 21 32.9	11.336	16	13 24 38.92	2.1489	12 2 14.9	9.967
17	11 47 55.74	1.9811	3 32 52.9	11.330	17	13 26 47.98	2.1533	12 12 11.4	9.913
18	11 49 54.68	1.9837	3 44 12.5	11.324	18	13 28 57.31	2.1578	12 22 4.5	9.857
19	11 51 53.77	1.9863	3 55 31.7	11.317	19	13 31 6.91	2.1623	12 31 54.3	9.801
20	11 53 53.03	1.9890	4 6 50.5	11.308	20	13 33 16.77	2.1667	12 41 40.6	9.743
21	11 55 52.45	1.9917	4 18 8.7	11.299	21	13 35 26.90	2.1711	12 51 23.4	9.683
22	11 57 52.04	1.9946	4 29 26.4	11.288	22	13 37 37.30	2.1756	13 1 2.6	9.623
23	11 59 51.80	1.9974	4 40 43.4	11.278	23	13 39 47.97	2.1801	13 10 38.2	9.562
24	12 1 51.73	2.0004	S. 4 51 59.8	11.265	24	13 41 58.91	2.1846	S. 13 20 10.0	9.499

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 13.					THURSDAY 15.				
0	13 41 58.91	2.1846	S. 13° 20' 10.0	9.499	0	15 32 4.65	2.3998	S. 19° 22' 20.5	5.168
1	13 44 10.12	2.1891	13 29 38.0	9.435	1	15 34 28.57	2.4008	19 27 27.2	5.088
2	13 46 21.60	2.1937	13 39 2.2	9.370	2	15 36 52.71	2.4041	19 32 26.9	4.986
3	13 48 33.36	2.1983	13 48 22.5	9.306	3	15 39 17.07	2.4078	19 37 19.6	4.819
4	13 50 45.39	2.2029	13 57 38.8	9.237	4	15 41 41.65	2.4118	19 42 5.2	4.701
5	13 52 57.70	2.2074	14 6 51.0	9.169	5	15 44 6.44	2.4149	19 46 43.7	4.563
6	13 55 10.28	2.2120	14 15 59.1	9.099	6	15 46 31.44	2.4181	19 51 15.1	4.463
7	13 57 23.14	2.2166	14 25 3.0	9.029	7	15 48 56.64	2.4217	19 55 39.2	4.343
8	13 59 36.27	2.2212	14 34 2.6	8.957	8	15 51 22.05	2.4250	19 59 56.1	4.220
9	14 1 49.68	2.2258	14 42 57.9	8.884	9	15 53 47.66	2.4284	20 4 5.7	4.098
10	14 4 3.37	2.2304	14 51 48.7	8.809	10	15 56 13.46	2.4316	20 8 7.9	3.975
11	14 6 17.34	2.2351	15 0 35.1	8.735	11	15 58 39.46	2.4348	20 12 2.7	3.851
12	14 8 31.58	2.2397	15 9 16.9	8.658	12	16 1 5.64	2.4378	20 15 50.0	3.727
13	14 10 46.10	2.2443	15 17 54.1	8.581	13	16 3 32.01	2.4409	20 19 29.9	3.602
14	14 13 0.90	2.2489	15 26 26.6	8.502	14	16 5 58.55	2.4439	20 23 2.2	3.475
15	14 15 15.98	2.2536	15 34 54.3	8.422	15	16 8 25.27	2.4469	20 26 26.9	3.348
16	14 17 31.33	2.2582	15 43 17.2	8.340	16	16 10 52.17	2.4499	20 29 44.0	3.220
17	14 19 46.97	2.2629	15 51 35.2	8.258	17	16 13 19.23	2.4524	20 32 53.5	3.093
18	14 22 2.88	2.2676	15 59 48.2	8.175	18	16 15 46.46	2.4550	20 35 55.2	2.964
19	14 24 19.07	2.2722	16 7 56.2	8.091	19	16 18 13.84	2.4576	20 38 49.2	2.836
20	14 26 35.54	2.2768	16 15 59.1	8.008	20	16 20 41.37	2.4601	20 41 35.4	2.706
21	14 28 52.29	2.2814	16 23 56.8	7.918	21	16 23 9.05	2.4626	20 44 13.8	2.574
22	14 31 9.31	2.2860	16 31 49.3	7.830	22	16 25 36.88	2.4649	20 46 44.3	2.444
23	14 33 26.61	2.2906	S. 16° 39' 36.5	7.742	23	16 28 4.85	2.4678	S. 20° 49' 7.0	2.313
WEDNESDAY 14.					FRIDAY 16.				
0	14 35 44.17	2.2961	S. 16° 47' 18.3	7.652	0	16 30 32.96	2.4694	S. 20° 51' 21.8	2.181
1	14 38 2.01	2.2997	16 54 54.7	7.562	1	16 33 1.19	2.4716	20 53 28.7	2.048
2	14 40 20.13	2.3043	17 2 25.5	7.468	2	16 35 29.55	2.4736	20 55 27.6	1.916
3	14 42 38.52	2.3088	17 9 50.8	7.374	3	16 37 58.03	2.4758	20 57 18.6	1.783
4	14 44 57.18	2.3133	17 17 10.4	7.279	4	16 40 26.62	2.4774	20 59 1.6	1.649
5	14 47 16.11	2.3177	17 24 24.3	7.184	5	16 42 55.32	2.4798	21 0 36.5	1.515
6	14 49 35.30	2.3221	17 31 32.5	7.087	6	16 45 24.13	2.4810	21 2 3.4	1.381
7	14 51 54.76	2.3266	17 38 34.8	6.989	7	16 47 53.04	2.4827	21 3 22.2	1.246
8	14 54 14.49	2.3309	17 45 31.2	6.890	8	16 50 22.05	2.4842	21 4 32.9	1.111
9	14 56 34.48	2.3353	17 52 21.7	6.791	9	16 52 51.15	2.4868	21 5 35.5	0.975
10	14 58 54.73	2.3406	17 59 6.1	6.690	10	16 55 20.34	2.4871	21 6 29.9	0.839
11	15 1 15.24	2.3440	18 5 44.5	6.589	11	16 57 49.61	2.4884	21 7 16.1	0.703
12	15 3 36.01	2.3483	18 12 16.7	6.485	12	17 0 18.95	2.4896	21 7 54.2	0.567
13	15 5 57.04	2.3527	18 18 42.7	6.381	13	17 2 48.36	2.4908	21 8 24.1	0.430
14	15 8 18.33	2.3569	18 25 2.4	6.275	14	17 5 17.84	2.4917	21 8 45.8	0.294
15	15 10 39.87	2.3611	18 31 15.8	6.169	15	17 7 47.37	2.4927	21 8 59.3	0.157
16	15 13 1.66	2.3653	18 37 22.7	6.061	16	17 10 16.96	2.4935	21 9 4.6	0.030
17	15 15 23.70	2.3695	18 43 23.2	5.953	17	17 12 46.60	2.4943	21 9 1.7	0.117
18	15 17 45.98	2.3733	18 49 17.1	5.844	18	17 15 16.28	2.4960	21 8 50.5	0.255
19	15 20 8.50	2.3773	18 55 4.5	5.734	19	17 17 46.01	2.4967	21 8 31.1	0.393
20	15 22 31.26	2.3813	19 0 45.2	5.623	20	17 20 15.77	2.4993	21 8 3.4	0.530
21	15 24 54.26	2.3853	19 6 19.2	5.511	21	17 22 45.56	2.4967	21 7 27.5	0.667
22	15 27 17.49	2.3892	19 11 46.5	5.397	22	17 25 15.37	2.4970	21 6 43.4	0.804
23	15 29 40.96	2.3930	19 17 6.9	5.283	23	17 27 45.21	2.4974	21 5 51.0	0.942
24	15 32 4.65	2.3968	S. 19° 22' 20.5	5.168	24	17 30 15.06	2.4975	S. 21° 4' 50.4	1.079

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 17.					MONDAY 19.				
0	17 30 15.06	2.4976	S. 21° 4' 50.4	1.079	0	19 28 51.91	2.4900	S. 17° 40' 15.1	7.326
1	17 32 44.91	2.4976	21 3 41.5	1.217	1	19 31 17.02	2.4171	17 32 57.5	7.346
2	17 35 14.76	2.4974	21 2 24.4	1.354	2	19 33 41.96	2.4141	17 25 33.3	7.446
3	17 37 44.61	2.4974	21 0 59.0	1.492	3	19 36 6.72	2.4112	17 18 2.5	7.566
4	17 40 14.45	2.4973	20 59 25.4	1.629	4	19 38 31.30	2.4082	17 10 25.1	7.676
5	17 42 44.28	2.4971	20 57 43.6	1.766	5	19 40 55.70	2.4052	17 2 41.3	7.784
6	17 45 14.10	2.4967	20 55 53.5	1.902	6	19 43 19.93	2.4021	16 54 51.0	7.896
7	17 47 43.89	2.4963	20 53 55.2	2.039	7	19 45 43.97	2.3991	16 46 54.4	7.997
8	17 50 13.66	2.4960	20 51 48.8	2.175	8	19 48 7.82	2.3960	16 38 51.4	8.106
9	17 52 43.40	2.4953	20 49 34.2	2.312	9	19 50 31.49	2.3929	16 30 42.2	8.204
10	17 55 13.10	2.4947	20 47 11.4	2.447	10	19 52 54.97	2.3898	16 22 26.9	8.306
11	17 57 42.76	2.4940	20 44 40.5	2.583	11	19 55 18.27	2.3868	16 14 05.4	8.408
12	18 0 12.38	2.4931	20 42 1.4	2.718	12	19 57 41.38	2.3836	16 5 37.9	8.508
13	18 2 41.94	2.4922	20 39 14.2	2.854	13	20 0 4.29	2.3803	15 57 4.4	8.606
14	18 5 11.44	2.4912	20 36 18.9	2.988	14	20 2 27.02	2.3772	15 48 24.9	8.706
15	18 7 40.88	2.4903	20 33 15.5	3.123	15	20 4 49.56	2.3741	15 39 39.6	8.803
16	18 10 10.26	2.4890	20 30 4.1	3.257	16	20 7 11.91	2.3709	15 30 48.5	8.899
17	18 12 39.57	2.4878	20 26 44.6	3.392	17	20 9 34.07	2.3677	15 21 51.6	8.996
18	18 15 8.80	2.4866	20 23 17.1	3.524	18	20 11 56.03	2.3645	15 12 49.1	9.097
19	18 17 37.95	2.4853	20 19 41.6	3.657	19	20 14 17.81	2.3613	15 3 40.9	9.193
20	18 20 7.03	2.4838	20 15 58.2	3.789	20	20 16 39.39	2.3581	14 54 27.2	9.274
21	18 22 36.02	2.4823	20 12 6.8	3.922	21	20 19 0.78	2.3549	14 45 8.0	9.365
22	18 25 4.91	2.4807	20 8 7.5	4.053	22	20 21 21.98	2.3517	14 35 43.4	9.454
23	18 27 33.71	2.4791	S. 20° 4' 0.3	4.186	23	20 23 42.99	2.3485	S. 14° 26' 13.4	9.543
SUNDAY 18.					TUESDAY 20.				
0	18 30 2.40	2.4774	S. 19° 59' 45.3	4.315	0	20 26 3.80	2.3453	S. 14° 16' 38.2	9.639
1	18 32 30.99	2.4756	19 55 22.5	4.445	1	20 28 24.42	2.3421	14 6 57.8	9.716
2	18 34 59.47	2.4737	19 50 51.9	4.574	2	20 30 44.85	2.3389	13 57 12.3	9.800
3	18 37 27.84	2.4718	19 46 13.6	4.703	3	20 33 5.09	2.3356	13 47 21.7	9.884
4	18 39 56.09	2.4698	19 41 27.6	4.830	4	20 35 25.15	2.3327	13 37 26.2	9.968
5	18 42 24.23	2.4679	19 36 33.9	4.956	5	20 37 45.01	2.3296	13 27 25.7	10.048
6	18 44 52.24	2.4660	19 31 32.6	5.084	6	20 40 4.69	2.3264	13 17 20.4	10.128
7	18 47 20.13	2.4637	19 26 23.7	5.211	7	20 42 24.18	2.3232	13 7 10.3	10.208
8	18 49 47.88	2.4614	19 21 7.3	5.336	8	20 44 43.48	2.3202	12 56 55.5	10.286
9	18 52 15.50	2.4592	19 15 43.3	5.462	9	20 47 2.60	2.3171	12 46 36.0	10.363
10	18 54 42.99	2.4569	19 10 11.9	5.585	10	20 49 21.53	2.3141	12 36 12.0	10.437
11	18 57 10.34	2.4546	19 4 33.1	5.708	11	20 51 40.28	2.3109	12 25 43.5	10.512
12	18 59 37.54	2.4523	18 58 46.9	5.830	12	20 53 58.84	2.3079	12 15 10.6	10.584
13	19 2 4.60	2.4498	18 52 53.4	5.953	13	20 56 17.22	2.3048	12 4 33.3	10.657
14	19 4 31.51	2.4473	18 46 52.6	6.075	14	20 58 35.42	2.3018	11 53 51.8	10.727
15	19 6 58.27	2.4447	18 40 44.6	6.193	15	21 0 53.44	2.2986	11 43 6.0	10.796
16	19 9 24.87	2.4421	18 34 29.4	6.312	16	21 3 11.28	2.2956	11 32 16.1	10.866
17	19 11 51.32	2.4395	18 28 7.0	6.432	17	21 5 28.95	2.2926	11 21 22.1	10.933
18	19 14 17.61	2.4368	18 21 37.6	6.549	18	21 7 46.44	2.2893	11 10 24.2	10.998
19	19 16 43.74	2.4343	18 15 1.1	6.666	19	21 10 3.76	2.2873	10 59 22.4	11.063
20	19 19 9.71	2.4314	18 8 17.7	6.783	20	21 12 20.91	2.2845	10 48 16.7	11.128
21	19 21 35.51	2.4287	18 1 27.3	6.898	21	21 14 37.89	2.2817	10 37 7.3	11.188
22	19 24 1.15	2.4258	17 54 30.0	7.011	22	21 16 54.71	2.2789	10 25 54.2	11.248
23	19 26 26.62	2.4228	17 47 25.9	7.124	23	21 19 11.36	2.2761	10 14 37.5	11.308
24	19 28 51.91	2.4200	S. 17° 40' 15.1	7.236	24	21 21 27.84	2.2734	S. 10° 3' 17.2	11.368

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 21.					FRIDAY 23.				
0	^h 21 ^m 21 ^s 27.84	2.3784	S. 10° 3' 17.2"	11.3896	0	^h 23 ^m 8 ^s 8.89	2.1892	S. 0° 14' 16.8"	12.080
1	21 23 44.16	2.3706	9 51 53.4	11.424	1	23 10 20.16	2.1876	S. 0 1 35.4	12.087
2	21 26 0.31	2.3680	9 40 26.3	11.479	2	23 12 31.39	2.1860	N. 0 11 5.7	12.092
3	21 28 16.31	2.3653	9 28 55.9	11.534	3	23 14 42.58	2.1863	0 23 46.5	12.077
4	21 30 32.14	2.3627	9 17 22.2	11.587	4	23 16 53.74	2.1866	0 36 26.9	12.060
5	21 32 47.82	2.3601	9 5 45.3	11.640	5	23 19 4.86	2.1862	0 49 6.8	12.061
6	21 35 3.35	2.3576	8 54 5.4	11.690	6	23 21 15.96	2.1848	1 1 46.2	12.061
7	21 37 18.73	2.3551	8 42 22.4	11.741	7	23 23 27.03	2.1843	1 14 25.0	12.040
8	21 39 33.96	2.3526	8 30 36.5	11.788	8	23 25 38.07	2.1840	1 27 3.1	12.028
9	21 41 49.04	2.3501	8 18 47.7	11.836	9	23 27 49.09	2.1836	1 39 40.4	12.016
10	21 44 3.97	2.3478	8 6 56.2	11.881	10	23 30 0.10	2.1834	1 52 16.9	12.001
11	21 46 18.77	2.3454	7 55 1.9	11.927	11	23 32 11.09	2.1831	2 4 52.5	12.006
12	21 48 33.42	2.3431	7 43 5.0	11.969	12	23 34 22.07	2.1829	2 17 27.2	12.000
13	21 50 47.94	2.3408	7 31 5.5	12.012	13	23 36 33.03	2.1826	2 30 0.8	12.001
14	21 53 2.32	2.3385	7 19 3.6	12.052	14	23 38 43.98	2.1826	2 42 33.3	12.031
15	21 55 16.57	2.3363	7 6 59.2	12.093	15	23 40 54.92	2.1823	2 55 4.6	12.011
16	21 57 30.68	2.3343	6 54 52.5	12.130	16	23 43 5.86	2.1823	3 7 34.6	12.000
17	21 59 44.67	2.3321	6 42 43.5	12.167	17	23 45 16.79	2.1822	3 20 3.3	12.007
18	22 1 58.53	2.3301	6 30 32.4	12.202	18	23 47 27.73	2.1824	3 32 30.6	12.042
19	22 4 12.27	2.3280	6 18 19.1	12.238	19	23 49 38.67	2.1824	3 44 56.4	12.017
20	22 6 25.89	2.3261	6 6 3.8	12.271	20	23 51 49.62	2.1826	3 57 20.6	12.000
21	22 8 39.39	2.3241	5 53 46.5	12.304	21	23 54 0.57	2.1827	4 9 43.2	12.003
22	22 10 52.78	2.3222	5 41 27.3	12.334	22	23 56 11.54	2.1829	4 22 4.2	12.004
23	22 13 6.06	2.3203	S. 5 29 6.3	12.364	23	23 58 22.52	2.1831	N. 4 34 23.4	12.004
THURSDAY 22.					SATURDAY 24.				
0	22 15 19.22	2.3186	S. 5 16 48.6	12.391	0	0 0 33.51	2.1834	N. 4 46 40.7	12.072
1	22 17 32.27	2.3167	5 4 19.2	12.419	1	0 2 44.52	2.1836	4 58 56.2	12.041
2	22 19 45.22	2.3140	4 51 53.3	12.444	2	0 4 55.54	2.1840	5 11 9.6	12.007
3	22 21 58.06	2.3133	4 39 25.8	12.470	3	0 7 6.58	2.1843	5 23 21.0	12.173
4	22 24 10.81	2.3117	4 26 56.9	12.492	4	0 9 17.65	2.1847	5 35 30.2	12.125
5	22 26 23.46	2.3100	4 14 26.7	12.514	5	0 11 28.74	2.1851	5 47 37.2	12.088
6	22 28 36.01	2.3085	4 1 55.2	12.534	6	0 13 39.86	2.1856	5 59 42.0	12.000
7	22 30 48.47	2.3070	3 49 22.5	12.554	7	0 15 51.00	2.1860	6 11 44.4	12.021
8	22 33 0.85	2.3056	3 36 48.7	12.571	8	0 18 2.17	2.1864	6 23 44.5	11.980
9	22 35 13.14	2.3041	3 24 13.8	12.589	9	0 20 13.37	2.1869	6 35 42.1	11.998
10	22 37 25.34	2.3027	3 11 38.0	12.608	10	0 22 24.60	2.1876	6 47 37.1	11.806
11	22 39 37.46	2.3013	2 59 1.3	12.618	11	0 24 35.88	2.1883	6 59 29.5	11.861
12	22 41 49.50	2.3001	2 46 23.8	12.630	12	0 26 47.19	2.1890	7 11 19.2	11.806
13	22 44 1.46	2.1988	2 33 45.5	12.643	13	0 28 58.54	2.1896	7 23 6.2	11.760
14	22 46 13.35	2.1977	2 21 6.6	12.653	14	0 31 9.94	2.1908	7 34 50.3	11.711
15	22 48 25.18	2.1966	2 8 27.1	12.663	15	0 33 21.38	2.1910	7 46 31.6	11.663
16	22 50 36.95	2.1956	1 55 47.0	12.670	16	0 35 32.86	2.1918	7 58 9.9	11.613
17	22 52 48.64	2.1944	1 43 6.5	12.678	17	0 37 44.39	2.1926	8 9 45.2	11.563
18	22 55 0.27	2.1934	1 30 25.6	12.682	18	0 39 55.96	2.1933	8 21 17.4	11.510
19	22 57 11.84	2.1923	1 17 44.5	12.687	19	0 42 7.58	2.1941	8 32 46.5	11.467
20	22 59 23.36	2.1914	1 5 3.1	12.690	20	0 44 19.25	2.1950	8 44 12.3	11.408
21	23 1 34.81	2.1904	0 52 21.6	12.693	21	0 46 30.97	2.1960	8 55 34.9	11.348
22	23 3 46.21	2.1897	0 39 40.0	12.696	22	0 48 42.75	2.1967	9 6 54.1	11.291
23	23 5 57.57	2.1890	0 26 58.4	12.698	23	0 50 54.58	2.1976	9 18 9.9	11.234
24	23 8 8.89	2.1882	S. 0 14 16.8	12.690	24	0 53 6.46	2.1986	N. 9 29 22.2	11.175

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 25.					TUESDAY 27.				
0	0 53 6.46	2.1998	N. 9° 29' 22.2"	11.176	0	2 39 52.93	2.2491	N. 17° 0' 3.9"	7.276
1	0 55 18.41	2.1998	9 40 30.9	11.116	1	2 42 7.90	2.2499	17 7 17.5	7.176
2	0 57 30.41	2.2006	9 51 36.1	11.068	2	2 44 22.92	2.2506	17 14 25.0	7.076
3	0 59 42.48	2.2016	10 2 37.6	10.994	3	2 46 37.98	2.2514	17 21 26.5	6.974
4	1 1 54.60	2.2026	10 13 35.4	10.931	4	2 48 53.09	2.2520	17 28 21.9	6.873
5	1 4 6.79	2.2036	10 24 29.4	10.867	5	2 51 8.23	2.2527	17 35 11.2	6.771
6	1 6 19.03	2.2046	10 35 19.5	10.803	6	2 53 23.42	2.2533	17 41 54.4	6.668
7	1 8 31.33	2.2056	10 46 5.7	10.737	7	2 55 38.64	2.2540	17 48 31.4	6.566
8	1 10 43.70	2.2067	10 56 47.9	10.670	8	2 57 53.90	2.2546	17 55 2.2	6.461
9	1 12 56.13	2.2077	11 7 26.1	10.603	9	3 0 9.19	2.2551	18 1 26.7	6.357
10	1 15 8.62	2.2088	11 18 0.2	10.534	10	3 2 24.51	2.2556	18 7 45.0	6.252
11	1 17 21.18	2.2099	11 28 30.2	10.464	11	3 4 39.86	2.2561	18 13 57.0	6.147
12	1 19 33.81	2.2111	11 38 55.9	10.393	12	3 6 55.24	2.2565	18 20 2.7	6.042
13	1 21 46.51	2.2123	11 49 17.4	10.322	13	3 9 10.64	2.2569	18 26 2.1	5.937
14	1 23 59.28	2.2134	11 59 34.5	10.249	14	3 11 26.07	2.2573	18 31 55.1	5.830
15	1 26 12.12	2.2145	12 9 47.2	10.176	15	3 13 41.52	2.2576	18 37 41.7	5.723
16	1 28 25.02	2.2157	12 19 55.5	10.101	16	3 15 56.98	2.2579	18 43 21.9	5.616
17	1 30 37.99	2.2169	12 29 59.3	10.026	17	3 18 12.46	2.2582	18 48 55.7	5.508
18	1 32 51.03	2.2179	12 39 58.6	9.949	18	3 20 27.96	2.2585	18 54 23.0	5.401
19	1 35 4.14	2.2190	12 49 53.2	9.873	19	3 22 43.46	2.2588	18 59 43.8	5.293
20	1 37 17.31	2.2201	12 59 43.2	9.793	20	3 24 58.98	2.2590	19 4 58.2	5.186
21	1 39 30.56	2.2213	13 9 28.5	9.715	21	3 27 14.51	2.2593	19 10 6.0	5.076
22	1 41 43.87	2.2224	13 19 9.0	9.634	22	3 29 30.04	2.2596	19 15 7.3	4.967
23	1 43 57.25	2.2236	N. 13° 28' 44.6"	9.553	23	3 31 45.57	2.2598	N. 19° 20' 2.1"	4.858
MONDAY 26.					WEDNESDAY 28.				
0	1 46 10.70	2.2248	N. 13° 38' 15.4"	9.471	0	3 34 1.10	2.2597	N. 19° 24' 50.3"	4.748
1	1 48 24.22	2.2259	13 47 41.2	9.389	1	3 36 16.62	2.2597	19 29 31.9	4.638
2	1 50 37.81	2.2271	13 57 2.1	9.306	2	3 38 32.14	2.2595	19 34 6.9	4.528
3	1 52 51.47	2.2283	14 6 17.9	9.222	3	3 40 47.65	2.2594	19 38 35.4	4.419
4	1 55 5.20	2.2293	14 15 28.7	9.136	4	3 43 3.15	2.2592	19 42 57.2	4.308
5	1 57 18.99	2.2304	14 24 34.3	9.050	5	3 45 18.63	2.2579	19 47 12.4	4.197
6	1 59 32.85	2.2315	14 33 34.7	8.963	6	3 47 34.10	2.2576	19 51 20.9	4.087
7	2 1 46.78	2.2327	14 42 29.9	8.876	7	3 49 49.55	2.2573	19 55 22.8	3.977
8	2 4 0.77	2.2337	14 51 19.8	8.787	8	3 52 4.98	2.2569	19 59 18.1	3.866
9	2 6 14.82	2.2348	15 0 4.3	8.698	9	3 54 20.38	2.2565	20 3 6.7	3.754
10	2 8 28.94	2.2358	15 8 43.5	8.608	10	3 56 35.76	2.2560	20 6 48.6	3.643
11	2 10 43.12	2.2369	15 17 17.3	8.517	11	3 58 51.11	2.2555	20 10 23.8	3.532
12	2 12 57.37	2.2379	15 25 45.6	8.426	12	4 1 6.42	2.2549	20 13 52.4	3.420
13	2 15 11.68	2.2391	15 34 8.4	8.333	13	4 3 21.70	2.2543	20 17 14.2	3.307
14	2 17 26.06	2.2401	15 42 25.6	8.241	14	4 5 36.94	2.2536	20 20 29.3	3.196
15	2 19 40.50	2.2412	15 50 37.3	8.148	15	4 7 52.13	2.2528	20 23 37.7	3.084
16	2 21 55.00	2.2421	15 58 43.3	8.056	16	4 10 7.28	2.2521	20 26 39.4	2.973
17	2 24 9.56	2.2431	16 6 43.7	7.967	17	4 12 22.38	2.2513	20 29 34.4	2.861
18	2 26 24.17	2.2440	16 14 38.3	7.869	18	4 14 37.44	2.2506	20 32 22.7	2.749
19	2 28 38.83	2.2448	16 22 27.1	7.766	19	4 16 52.44	2.2498	20 35 4.3	2.638
20	2 30 53.55	2.2457	16 30 10.2	7.670	20	4 19 7.39	2.2490	20 37 39.2	2.526
21	2 33 8.32	2.2466	16 37 47.5	7.573	21	4 21 22.28	2.2477	20 40 7.3	2.413
22	2 35 23.14	2.2475	16 45 18.9	7.474	22	4 23 37.11	2.2468	20 42 28.8	2.302
23	2 37 38.01	2.2483	16 52 44.4	7.376	23	4 25 51.87	2.2458	20 44 43.6	2.191
24	2 39 52.93	2.2491	N. 17° 0' 3.9"	7.276	24	4 28 6.57	2.2448	N. 20° 46' 51.7"	2.079

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 29.					SATURDAY 31.				
0	4 ^h 28 ^m 6.57 ^s	2.2443	N.20° 46' 51.7"	2.079	0	6 ^h 13 ^m 42.26 ^s	2.1414	N.20° 22' 5.5"	2.983
1	4 30 21.19	2.2431	20 48 53.1	1.988	1	6 15 50.66	2.1388	20 19 3.6	3.079
2	4 32 35.74	2.2418	20 50 47.8	1.886	2	6 17 58.88	2.1356	20 15 56.0	3.173
3	4 34 50.21	2.2406	20 52 35.8	1.744	3	6 20 6.93	2.1327	20 12 42.7	3.268
4	4 37 4.61	2.2393	20 54 17.1	1.633	4	6 22 14.80	2.1297	20 9 23.8	3.362
5	4 39 18.93	2.2379	20 55 51.7	1.522	5	6 24 22.50	2.1268	20 5 59.2	3.457
6	4 41 33.16	2.2364	20 57 19.7	1.412	6	6 26 30.02	2.1238	20 2 29.0	3.549
7	4 43 47.30	2.2350	20 58 41.1	1.301	7	6 28 37.36	2.1208	19 58 53.3	3.643
8	4 46 1.36	2.2336	20 59 55.8	1.191	8	6 30 44.52	2.1178	19 55 12.0	3.734
9	4 48 15.33	2.2320	21 1 3.9	1.079	9	6 32 51.50	2.1149	19 51 25.2	3.826
10	4 50 29.20	2.2304	21 2 5.3	0.968	10	6 34 58.30	2.1119	19 47 32.9	3.916
11	4 52 42.98	2.2288	21 3 0.1	0.856	11	6 37 4.92	2.1090	19 43 35.2	4.007
12	4 54 56.66	2.2271	21 3 48.4	0.749	12	6 39 11.36	2.1060	19 39 32.1	4.096
13	4 57 10.23	2.2253	21 4 30.1	0.640	13	6 41 17.62	2.1028	19 35 23.6	4.186
14	4 59 23.69	2.2235	21 5 5.2	0.530	14	6 43 23.70	2.0996	19 31 9.8	4.274
15	5 1 37.04	2.2217	21 5 33.7	0.421	15	6 45 29.59	2.0967	19 26 50.6	4.363
16	5 3 50.29	2.2198	21 5 55.7	0.312	16	6 47 35.30	2.0937	19 22 26.2	4.450
17	5 6 3.42	2.2179	21 6 11.1	0.203	17	6 49 40.83	2.0906	19 17 56.5	4.538
18	5 8 16.44	2.2160	21 6 20.1	0.095	18	6 51 46.17	2.0876	19 13 21.6	4.624
19	5 10 29.34	2.2140	21 6 22.6	0.018	19	6 53 51.33	2.0844	19 8 41.5	4.711
20	5 12 42.12	2.2120	21 6 18.6	0.120	20	6 55 56.30	2.0814	19 3 56.3	4.796
21	5 14 54.77	2.2099	21 6 8.2	0.227	21	6 58 1.09	2.0783	18 59 5.9	4.882
22	5 17 7.30	2.2078	21 5 51.3	0.334	22	7 0 5.70	2.0753	18 54 10.5	4.966
23	5 19 19.70	2.2057	N.21 5 28.0	0.442	23	7 2 10.12	2.0723	N.18 49 10.0	5.049
FRIDAY 30.					SUNDAY, NOVEMBER 1.				
0	5 21 31.98	2.2034	N.21 4 58.3	0.548	0	7 4 14.36	2.0692	N.18 44 4.6	5.132
1	5 23 44.12	2.2012	21 4 22.2	0.654					
2	5 25 56.12	2.1989	21 3 39.8	0.760					
3	5 28 7.99	2.1967	21 2 51.0	0.866					
4	5 30 19.72	2.1943	21 1 55.9	0.971					
5	5 32 31.31	2.1919	21 0 54.5	1.076					
6	5 34 42.75	2.1896	20 59 46.8	1.180					
7	5 36 54.05	2.1872	20 58 32.9	1.284					
8	5 39 5.21	2.1847	20 57 12.8	1.387					
9	5 41 16.22	2.1823	20 55 46.4	1.491					
10	5 43 27.07	2.1797	20 54 13.9	1.593					
11	5 45 37.77	2.1771	20 52 35.3	1.696					
12	5 47 48.32	2.1744	20 50 50.5	1.798					
13	5 49 58.71	2.1718	20 48 59.6	1.898					
14	5 52 8.94	2.1691	20 47 2.7	1.999					
15	5 54 19.01	2.1666	20 44 59.7	2.100					
16	5 56 28.92	2.1638	20 42 50.7	2.199					
17	5 58 38.67	2.1611	20 40 35.7	2.299					
18	6 0 48.25	2.1584	20 38 14.8	2.398					
19	6 2 57.67	2.1557	20 35 47.9	2.498					
20	6 5 6.93	2.1529	20 33 15.1	2.598					
21	6 7 16.02	2.1501	20 30 36.4	2.693					
22	6 9 24.94	2.1473	20 27 51.9	2.790					
23	6 11 33.69	2.1443	20 25 1.6	2.887					
24	6 13 42.26	2.1414	N.20 22 5.5	2.983					

PHASES OF THE MOON.				
☾ Last Quarter, . .	d	h	m	
● New Moon, . .	12	6	42.0	
☾ First Quarter, . .	19	8	5.9	
○ Full Moon, . .	26	5	55.5	

☾ Apogee,	h	
☾ Perigee,	20	9.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dif.	IIIh.	P. L. of Dif.	VIh.	P. L. of Dif.	IXh.	P. L. of Dif.
1	Fomalhaut W.	88° 50' 17"	3281	90° 15' 26"	3266	91° 40' 17"	3283	93° 4' 50"	3297
	α Pegasi W.	70 27 43	3289	71 59 13	3261	73 30 27	3264	75 1 25	3276
	α Arietis W.	26 51 22	3278	28 22 2	3274	29 52 47	3272	31 23 35	3272
	Pollux E.	50 54 49	3210	49 22 43	3281	47 51 4	3263	46 19 52	3276
	Regulus E.	87 10 8	3299	85 35 39	3214	84 1 29	3229	82 27 39	3243
	SUN E.	127 2 6	3148	125 34 54	3163	124 8 1	3178	122 41 25	3198
2	Fomalhaut W.	100 2 55	3381	101 25 33	3399	102 47 51	3417	104 9 48	3436
	α Pegasi W.	82 32 35	3234	84 2 5	3247	85 31 20	3267	87 0 22	3289
	α Arietis W.	38 56 56	3292	40 27 19	3298	41 57 34	3298	43 27 41	3211
	Pollux E.	38 51 1	3206	37 22 47	3134	35 55 6	3154	34 28 2	3184
	Regulus E.	74 42 59	3211	73 10 54	3294	71 39 6	3297	70 7 34	3249
	SUN E.	115 32 49	3263	114 7 54	3276	112 43 15	3289	111 18 51	3293
3	α Pegasi W.	94 22 10	3122	95 49 53	3133	97 17 23	3143	98 44 41	3163
	α Arietis W.	50 56 11	3245	52 25 28	3262	53 54 37	3268	55 23 38	3266
	Aldebaran W.	17 46 23	3124	19 14 4	3114	20 41 56	3108	22 9 58	3101
	Pollux E.	27 22 55	3289	26 0 26	3443	24 38 58	3408	23 18 43	3384
	Regulus E.	62 33 34	3204	61 3 26	3214	59 33 30	3225	58 3 48	3284
	SUN E.	104 20 21	3268	102 57 17	3298	101 34 24	3277	100 11 41	3286
4	α Pegasi W.	105 58 27	3195	107 24 42	3204	108 50 47	3211	110 16 43	3220
	α Arietis W.	62 46 56	3291	64 15 17	3204	65 43 34	3209	67 11 45	3163
	Aldebaran W.	29 31 3	3296	30 59 18	3296	32 27 32	3298	33 55 44	3299
	Regulus E.	50 37 58	3274	49 9 17	3292	47 40 45	3269	46 12 22	3296
	SUN E.	93 20 30	3423	91 58 40	3430	90 36 57	3436	89 15 21	3440
5	α Arietis W.	74 31 45	3114	75 59 38	3115	77 27 29	3116	78 55 19	3116
	Aldebaran W.	41 16 30	3102	42 44 37	3101	44 12 45	3101	45 40 53	3101
	Regulus E.	38 52 20	3124	37 24 40	3130	35 57 7	3136	34 29 41	3141
	SUN E.	82 28 30	3457	81 7 18	3459	79 46 8	3480	78 24 59	3482
6	α Arietis W.	86 14 38	3110	87 42 35	3109	89 10 35	3106	90 38 37	3164
	Aldebaran W.	53 1 55	3291	54 30 15	3289	55 58 38	3286	57 27 5	3282
	Regulus E.	27 14 19	3176	25 47 41	3186	24 21 15	3198	22 55 3	3212
	SUN E.	71 39 19	3457	70 18 7	3454	68 56 52	3453	67 35 35	3449
7	α Arietis W.	97 59 51	3282	99 28 22	3277	100 57 0	3272	102 25 44	3288
	Aldebaran W.	64 50 42	3266	66 19 45	3263	67 48 54	3245	69 18 11	3289
	Pollux W.	24 34 55	3200	25 55 19	3448	27 16 41	3403	28 38 55	3382
	SUN E.	60 48 5	3426	59 26 18	3421	58 4 25	3414	56 42 24	3422
8	α Arietis W.	109 51 18	3233	111 20 50	3226	112 50 31	3218	114 20 21	3216
	Aldebaran W.	76 46 47	3206	78 17 0	3291	79 47 24	3282	81 17 58	3274
	Pollux W.	35 40 16	3211	36 . 6 12	3188	38 32 35	3166	39 59 25	3144
	SUN E.	49 50 25	3270	48 27 34	3280	47 4 32	3282	45 41 21	3244
9	Aldebaran W.	88 53 44	3234	90 25 32	3218	91 57 32	3206	93 29 45	3204
	Pollux W.	47 19 36	3292	48 48 44	3284	50 18 14	3219	51 48 3	3208
	SUN E.	38 42 48	3264	37 18 30	3284	35 54 0	3275	34 29 19	3266
10	Aldebaran W.	101 14 19	3238	102 47 57	3228	104 21 49	3216	105 55 56	3204
	Pollux W.	59 22 2	3277	60 53 47	3212	62 25 50	3206	63 58 11	3203
	SUN E.	27 23 2	3217	25 57 13	3208	24 31 15	3201	23 5 7	3198

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Fomalhaut W.	94° 29' 5"	3313	95° 53' 1"	3329	97° 16' 39"	3346	98° 39' 57"	3364
	α Pegasi W.	76 32 9	3287	78 2 38	3290	79 32 52	3011	81 2 51	3023
	α Arietis W.	32 54 23	3274	34 25 8	3277	35 55 49	3281	37 26 26	3286
	Pollux E.	44 49 8	3297	43 18 52	3021	41 49 5	3044	40 19 47	3070
	Regulus E.	80 54 7	3287	79 20 53	3273	77 47 58	3284	76 15 19	3289
	SUN E.	121 15 7	3306	119 49 7	3323	118 23 25	3326	116 57 58	3361
2	Fomalhaut W.	105 31 25	3454	106 52 41	3474	108 13 34	3496	109 34 4	3514
	α Pegasi W.	88 29 10	3079	89 57 45	3001	91 26 6	3101	92 54 15	3112
	α Arietis W.	44 57 40	3018	46 27 31	3025	47 57 13	3032	49 26 46	3039
	Pollux E.	33 1 34	3218	31 35 46	3254	30 10 41	3294	28 46 22	3338
	Regulus E.	68 36 17	3289	67 5 14	3273	65 34 28	3283	64 3 54	3294
	SUN E.	109 54 42	3314	108 30 47	3326	107 7 6	3337	105 43 37	3348
3	α Pegasi W.	100 11 47	3161	101 38 43	3170	103 5 28	3178	104 32 3	3188
	α Arietis W.	56 52 31	3070	58 21 17	3076	59 49 56	3081	61 18 29	3086
	Aldebaran W.	23 38 7	3098	25 6 19	3096	26 34 33	3098	28 2 48	3096
	Pollux E.	21 59 51	3075	20 42 37	3276	19 27 10	3208	18 13 58	4006
	Regulus E.	56 34 17	3043	55 4 56	3062	53 35 47	3059	52 6 47	3069
	SUN E.	98 49 8	3305	97 26 46	3402	96 4 32	3410	94 42 27	3417
4	α Pegasi W.	111 42 29	3227	113 8 6	3236	114 33 34	3241	115 58 55	3248
	α Arietis W.	68 39 51	3106	70 7 54	3108	71 35 54	3110	73 3 51	3113
	Aldebaran W.	35 23 55	3100	36 52 5	3100	38 20 15	3101	39 48 23	3102
	Regulus E.	44 44 7	3100	43 15 57	3110	41 47 59	3114	40 20 6	3119
	SUN E.	87 53 50	3445	86 32 24	3448	85 11 2	3452	83 49 44	3456
5	α Arietis W.	80 23 10	3116	81 51 1	3115	83 18 52	3114	84 46 44	3113
	Aldebaran W.	47 9 2	3100	48 37 12	3097	50 5 25	3096	51 33 39	3095
	Regulus E.	33 2 21	3148	31 35 9	3153	30 8 4	3161	28 41 8	3167
	SUN E.	77 3 52	3463	75 42 45	3461	74 21 37	3461	73 0 29	3459
6	α Arietis W.	92 6 42	3100	93 34 52	3090	95 3 7	3092	96 31 26	3087
	Aldebaran W.	58 55 37	3077	60 24 15	3073	61 52 58	3068	63 21 47	3063
	Regulus E.	21 29 8	3230	20 3 34	3262	18 38 26	3282	17 13 53	3319
	SUN E.	66 14 14	3446	64 52 49	3441	63 31 19	3438	62 9 45	3432
7	α Arietis W.	103 54 35	3080	105 23 33	3053	106 52 40	3047	108 21 55	3040
	Aldebaran W.	70 47 36	3031	72 17 10	3024	73 46 53	3017	75 16 45	3009
	Pollux W.	30 1 55	3226	31 25 37	3294	32 49 56	3264	34 14 50	3236
	SUN E.	55 20 17	3400	53 58 1	3304	52 35 38	3296	51 13 6	3279
8	α Arietis W.	115 50 21	3002	117 20 31	2994	118 50 51	2986	120 21 21	2978
	Aldebaran W.	82 48 43	2965	84 19 40	2956	85 50 49	2946	87 22 10	2935
	Pollux W.	41 26 41	3124	42 54 21	3106	44 22 24	3087	45 50 49	3069
	SUN E.	44 18 0	3234	42 54 28	3236	41 30 45	3216	40 6 52	3206
9	Aldebaran W.	95 2 12	2983	96 34 53	2973	98 7 48	2961	99 40 57	2951
	Pollux W.	53 18 12	2998	54 48 40	2973	56 19 28	2967	57 50 35	2941
	SUN E.	33 4 27	3266	31 39 24	3246	30 14 9	3226	28 48 42	3226
10	Aldebaran W.	107 30 17	2793	109 4 54	2782	110 39 45	2769	112 14 53	2760
	Pollux W.	65 30 51	2970	67 3 48	2967	68 37 2	2943	70 10 34	2929
	SUN E.	21 38 50	3186	20 12 26	3183	18 45 57	3182	17 19 26	3182

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
14	SUN W.	21° 14' 30"	2866	22° 47' 34"	2848	24° 20' 59"	2836	25° 54' 41"	2822
	Antares E.	26 9 35	2891	24 30 28	2860	22 51 31	2810	21 12 49	2826
	α Aquilæ E.	80 17 47	2917	78 45 50	2913	77 13 48	2912	75 41 45	2910
	Fomalhaut E.	108 8 29	2910	106 38 29	2998	105 8 8	2977	103 37 26	2962
15	SUN W.	33 46 54	2771	35 22 0	2763	36 57 17	2754	38 32 45	2746
	α Aquilæ E.	68 1 34	2924	66 29 45	2991	64 58 5	2989	63 26 35	2949
	Fomalhaut E.	95 59 42	2904	94 27 28	2994	92 55 2	2987	91 22 27	2980
	α Pegasi E.	114 40 24	2996	113 1 23	2996	111 22 9	2976	109 42 40	2966
16	SUN W.	46 32 32	2713	48 8 56	2706	49 45 28	2701	51 22 7	2694
	α Aquilæ E.	55 53 4	2939	54 23 28	2964	52 54 22	2961	51 25 49	2113
	Fomalhaut E.	83 37 44	2892	82 4 36	2960	80 31 26	2960	78 58 16	2962
	α Pegasi E.	101 22 14	2930	99 41 36	2919	98 0 49	2913	96 19 54	2907
17	SUN W.	59 27 11	2699	61 4 32	2666	62 41 58	2663	64 19 28	2667
	Antares W.	16 37 3	2699	18 16 41	2697	19 57 16	2494	21 38 38	2498
	Fomalhaut E.	71 13 22	2885	69 40 44	2904	68 8 18	2906	66 36 5	2917
	α Pegasi E.	87 53 36	2485	86 12 2	2492	84 30 24	2490	82 48 43	2477
18	SUN W.	72 28 20	2640	74 6 20	2638	75 44 24	2634	77 22 33	2623
	Antares W.	30 12 47	2990	31 56 36	2980	33 40 39	2972	35 24 54	2965
	Fomalhaut E.	58 59 35	2906	57 29 30	2930	55 59 55	2930	54 30 55	2929
	α Pegasi E.	74 19 38	2472	72 37 46	2473	70 55 54	2474	69 14 4	2476
19	α Arietis E.	117 32 19	2968	115 47 59	2966	114 3 34	2961	112 19 3	2967
	SUN W.	85 34 7	2620	87 12 35	2618	88 51 6	2616	90 29 39	2614
	Antares W.	44 8 29	2937	45 53 34	2933	47 38 45	2929	49 24 2	2926
	Fomalhaut E.	47 16 59	2912	45 53 1	2973	44 30 13	2441	43 8 43	2419
20	α Pegasi E.	60 45 37	2491	59 4 11	2497	57 22 53	2604	55 41 45	2611
	α Arietis E.	103 35 14	2942	101 50 16	2939	100 5 14	2928	98 20 10	2926
	SUN W.	98 42 54	2608	100 21 38	2607	102 0 23	2607	103 39 9	2606
	Antares W.	58 11 28	2914	59 57 7	2913	61 42 48	2911	63 28 32	2910
21	Fomalhaut E.	36 46 14	4092	35 36 5	4269	34 28 34	4462	33 23 59	4676
	α Pegasi E.	47 19 11	2968	45 39 32	2966	44 0 16	2904	42 21 26	2926
	α Arietis E.	89 34 13	2930	87 48 57	2929	86 3 40	2928	84 18 22	2926
	Aldebaran E.	122 47 2	2907	121 1 13	2906	119 15 22	2904	117 29 29	2903
22	SUN W.	111 53 4	2606	113 31 51	2607	115 10 36	2607	116 49 21	2606
	Antares W.	72 17 29	2907	74 3 18	2907	75 49 7	2906	77 34 55	2906
	α Pegasi E.	34 16 17	2796	32 41 43	2848	31 8 18	2910	29 36 12	2962
	α Arietis E.	75 31 55	2931	73 46 40	2923	72 1 27	2924	70 16 17	2926
23	Aldebaran E.	108 39 46	2902	106 53 49	2901	105 7 51	2902	103 21 54	2901
	SUN W.	125 2 35	2617	126 41 7	2621	128 19 34	2623	129 57 59	2626
	Antares W.	86 23 37	2916	88 9 15	2917	89 54 50	2919	91 40 22	2923
	α Aquilæ W.	40 7 50	2437	41 29 25	2906	42 52 27	2904	44 16 46	2926
24	α Arietis E.	61 31 18	2961	59 46 33	2946	58 1 53	2969	56 17 20	2964
	Aldebaran E.	94 32 30	2909	92 46 44	2911	91 1 1	2914	89 15 22	2916
	SUN W.	100 26 53	2939	102 11 55	2944	103 56 51	2946	105 41 40	2964
	α Aquilæ W.	51 33 19	2929	53 2 56	2901	54 33 8	2976	56 3 51	2966
25	Fomalhaut W.	30 24 25	2916	31 17 21	2912	32 14 7	4764	33 14 21	4823
	α Arietis E.	47 36 40	2999	45 53 4	2408	44 9 41	2418	42 26 32	2429

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
14	SUN W.	27° 28' 39"	2611	29° 2' 52"	2606	30° 37' 20"	2700	32° 12' 1"	2781
	Antares E.	19 34 28	2647	17 56 37	2660	16 19 30	2736	14 43 25	2794
	α Aquilæ E.	74 9 39	2611	72 37 34	2612	71 5 31	2614	69 33 30	2616
	Fomalhaut E.	102 6 26	2647	100 35 7	2636	99 3 33	2624	97 31 45	2612
15	SUN W.	40 8 24	2739	41 44 12	2732	43 20 10	2725	44 56 17	2718
	α Aquilæ E.	61 55 18	2660	60 24 15	2674	58 53 30	2690	57 23 5	2699
	Fomalhaut E.	89 49 43	2674	88 16 51	2669	86 43 53	2666	85 10 50	2663
	α Pegasi E.	108 2 59	2656	106 23 4	2648	104 42 58	2640	103 2 41	2633
16	SUN W.	52 58 55	2669	54 35 50	2666	56 12 50	2679	57 49 58	2676
	α Aquilæ E.	49 57 55	3147	48 30 42	3166	47 4 16	3232	45 38 45	3262
	Fomalhaut E.	77 25 8	2664	75 52 3	2666	74 19 3	2673	72 46 9	2676
	α Pegasi E.	94 38 51	2602	92 57 41	2499	91 16 26	2494	89 35 4	2489
17	SUN W.	65 57 5	2664	67 34 46	2660	69 12 33	2647	70 50 24	2643
	Antares W.	23 20 36	2446	25 3 5	2429	26 45 59	2414	28 29 14	2401
	Fomalhaut E.	65 4 8	2661	63 32 28	2646	62 1 7	2663	60 30 8	2664
	α Pegasi E.	81 6 58	2475	79 25 10	2474	77 43 20	2473	76 1 29	2473
18	SUN W.	79 0 45	2629	80 39 0	2626	82 17 20	2624	83 55 42	2622
	Antares W.	37 9 19	2367	38 53 55	2392	40 38 39	2346	42 23 31	2343
	Fomalhaut E.	53 2 33	3136	51 34 54	3164	50 8 2	3207	48 42 1	3237
	α Pegasi E.	67 32 16	2477	65 50 30	2479	64 8 47	2462	62 27 9	2467
	α Arietis E.	110 34 27	2364	108 49 46	2360	107 5 0	2347	105 20 9	2344
19	SUN W.	92 8 15	2613	93 46 52	2612	95 25 31	2610	97 4 12	2610
	Antares W.	51 9 23	2324	52 54 48	2320	54 40 18	2318	56 25 51	2316
	Fomalhaut E.	41 48 40	3007	40 30 13	3706	39 13 32	3818	37 58 48	3846
	α Pegasi E.	54 0 47	2620	52 20 1	2629	50 39 28	2640	48 59 10	2653
	α Arietis E.	96 35 3	2334	94 49 53	2333	93 4 41	2332	91 19 28	2331
20	SUN W.	105 17 56	2606	106 56 43	2606	108 35 30	2606	110 14 17	2606
	Antares W.	65 14 17	2309	67 0 3	2307	68 45 52	2308	70 31 40	2307
	Fomalhaut E.	32 22 39	4983	31 24 51	6238	30 30 58	6494	29 41 19	6621
	α Pegasi E.	40 43 6	2661	39 5 20	2679	37 28 12	2713	35 51 50	2760
	α Arietis E.	82 33 4	2326	80 47 46	2326	79 2 28	2329	77 17 11	2330
	Aldebaran E.	115 43 34	2303	113 57 38	2303	112 11 41	2302	110 25 44	2301
21	SUN W.	118 28 4	2610	120 6 45	2612	121 45 24	2613	123 24 1	2616
	Antares W.	79 20 43	2309	81 6 29	2310	82 52 14	2311	84 37 57	2313
	α Pegasi E.	28 5 37	3068	26 36 50	3174	25 10 10	3300	23 45 59	3466
	α Arietis E.	68 31 10	2338	66 46 6	2340	65 1 5	2344	63 16 10	2346
	Aldebaran E.	101 35 58	2303	99 50 3	2304	98 4 10	2306	96 18 19	2307
22	SUN W.	131 36 19	2629	133 14 35	2633	134 52 45	2637	136 30 50	2641
	Antares W.	93 25 50	2326	95 11 13	2326	96 56 32	2332	98 41 45	2336
	α Aquilæ W.	45 42 14	3163	47 8 44	3136	48 36 8	3097	50 4 21	3060
	α Arietis E.	54 32 54	2370	52 48 36	2377	51 4 28	2362	49 20 28	2361
	Aldebaran E.	87 29 46	2319	85 44 14	2322	83 58 47	2326	82 13 25	2329
23	Antares W.	107 26 21	2369	109 10 55	2366	110 55 20	2371	112 39 36	2377
	α Aquilæ W.	57 35 1	2936	59 6 35	2920	60 38 29	2906	62 10 41	2894
	Fomalhaut W.	34 17 44	4341	35 23 59	4177	36 32 47	4033	37 43 54	3909
	α Arietis E.	40 43 39	2441	39 1 3	2466	37 18 46	2469	35 36 49	2466

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Aldebaran E.	80° 28' 8"	2333	78° 42' 57"	2336	76° 57' 53"	2343	75° 12' 56"	2347
24	α Aquilæ W.	63 43 8	2384	65 15 47	2376	66 48 37	2389	68 21 35	2386
	Fomalhaut W.	38 57 5	3799	40 12 8	3706	41 28 50	3622	42 47 1	3648
	α Arietis E.	33 55 16	2505	32 14 10	2527	30 33 34	2561	28 53 31	2577
	Aldebaran E.	66 30 5	2379	64 45 58	2384	63 2 1	2391	61 18 14	2399
	Pollux E.	108 35 3	2447	106 52 35	2452	105 10 14	2467	103 28 0	2464
25	α Aquilæ W.	76 7 19	2392	77 40 27	2386	79 13 30	2389	80 46 29	2374
	Fomalhaut W.	49 35 3	3229	50 59 16	3265	52 24 8	3227	53 49 33	3211
	α Pegasi W.	28 33 50	3093	30 2 8	3035	31 31 37	2986	33 2 5	2949
	Aldebaran E.	52 42 15	2443	50 59 42	2463	49 17 23	2463	47 35 18	2474
	Pollux E.	94 59 14	2506	93 18 1	2506	91 36 59	2518	89 56 11	2527
26	α Aquilæ W.	88 29 15	2916	90 1 14	2925	91 33 1	2989	93 4 31	2960
	Fomalhaut W.	61 2 44	3135	62 30 11	3126	63 57 49	3121	65 25 34	3116
	α Pegasi W.	40 44 6	2839	42 17 43	2829	43 51 33	2821	45 25 33	2816
	Aldebaran E.	39 8 55	2535	37 28 31	2580	35 48 27	2564	34 8 42	2579
	Pollux E.	81 35 35	2580	79 56 13	2599	78 17 7	2604	76 38 18	2617
27	α Aquilæ W.	100 37 43	3027	102 7 22	3044	103 36 40	3066	105 5 34	3092
	Fomalhaut W.	72 45 2	3116	74 12 52	3121	75 40 36	3126	77 8 14	3123
	α Pegasi W.	53 16 32	2816	54 50 40	2819	56 24 45	2823	57 58 43	2828
	Pollux E.	68 28 38	2685	66 51 38	2700	65 14 58	2716	63 38 38	2731
	Regulus E.	105 4 5	3016	103 25 32	2936	101 47 15	2940	100 9 15	2952
28	Fomalhaut W.	84 24 14	3175	85 50 53	3187	87 17 18	3196	88 43 29	3211
	α Pegasi W.	65 46 31	2866	67 19 34	2875	68 52 25	2883	70 25 5	2894
	α Arietis W.	22 16 10	2988	23 46 40	2965	25 17 37	2949	26 48 54	2987
	Pollux E.	55 42 16	2814	54 8 6	2832	52 34 20	2860	51 0 57	2869
	Regulus E.	92 3 28	2717	90 27 11	2730	88 51 11	2744	87 15 28	2756
	Venus E.	122 37 26	2906	121 3 8	2922	119 29 9	2937	117 55 29	2952
29	Fomalhaut W.	95 50 28	3222	97 15 0	3300	98 39 12	3316	100 3 6	3332
	α Pegasi W.	78 5 6	2946	79 36 26	2966	81 7 31	2989	82 38 23	2981
	α Arietis W.	34 27 24	2927	35 59 8	2931	37 30 48	2935	39 2 22	2940
	Pollux E.	43 20 26	2976	41 49 42	2998	40 19 27	3024	38 49 44	3060
	Regulus E.	79 21 11	2821	77 47 11	2835	76 13 28	2847	74 40 1	2859
	Venus E.	110 11 56	2926	108 40 10	2940	107 8 42	2954	105 37 32	2969
	Saturn E.	123 19 30	2873	121 46 36	2884	120 13 57	2896	118 41 33	2906
30	α Pegasi W.	90 9 6	3088	91 38 32	3049	93 7 44	3061	94 36 41	3072
	α Arietis W.	46 38 22	2973	48 9 8	2981	49 39 45	2989	51 10 12	2997
	Pollux E.	31 29 59	3214	30 4 6	3265	28 39 3	3302	27 14 54	3356
	Regulus E.	66 56 48	2922	65 24 57	2933	63 53 20	2944	62 21 57	2957
	Venus E.	98 6 5	3037	96 36 38	3051	95 7 28	3064	93 38 34	3076
	Saturn E.	111 3 11	2964	109 32 13	2975	108 1 29	2986	106 30 57	2993
	Sun E.	135 31 30	3367	134 6 40	3380	132 42 5	3392	131 17 44	3393
31	α Arietis W.	58 40 4	3084	60 9 35	3041	61 38 57	3048	63 8 10	3056
	Aldebaran W.	25 21 53	3048	26 51 6	3051	28 20 16	3054	29 49 22	3056
	Regulus E.	54 48 39	3010	53 18 39	3021	51 48 52	3030	50 19 17	3040
	Venus E.	86 17 44	3134	84 50 16	3145	83 23 1	3155	81 55 58	3166
	Saturn E.	99 1 27	3043	97 32 8	3052	96 2 59	3060	94 34 1	3068
	Sun E.	124 19 5	3355	122 55 57	3365	121 33 1	3374	120 10 15	3383

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
23	Aldebaran E.	73° 28' 5"	2363	71° 43' 22"	2360	69° 58' 48"	2364	68° 14' 22"	2371
24	α Aquilæ W.	69 54 39	2902	71 27 47	2860	73 0 58	2860	74 34 9	2860
	Fomalhaut W.	44 6 32	2485	45 27 13	2430	46 48 56	2380	48 11 35	2338
	α Arietis E.	27 14 5	2610	25 35 23	2648	23 57 33	2602	22 20 43	2744
	Aldebaran E.	59 34 38	2407	57 51 13	2416	56 8 1	2424	54 25 1	2433
	Pollux E.	101 45 56	2470	100 4 0	2477	98 22 14	2485	96 40 39	2492
25	α Aquilæ W.	82 19 21	2881	83 52 4	2898	85 24 38	2898	86 57 2	2905
	Fomalhaut W.	55 15 29	2191	56 41 49	2174	58 8 29	2168	59 35 29	2146
	α Pegasi W.	34 33 22	2917	36 5 19	2891	37 37 50	2870	39 10 47	2856
	Aldebaran E.	45 53 28	2485	44 11 54	2497	42 30 37	2510	40 49 37	2522
	Pollux E.	88 15 35	2637	86 35 13	2647	84 55 5	2668	83 15 12	2689
26	α Aquilæ W.	94 35 47	2905	96 6 43	2978	97 37 23	2904	99 7 43	2910
	Fomalhaut W.	66 53 24	2113	68 21 18	2112	69 49 13	2111	71 17 9	2114
	α Pegasi W.	46 59 40	2813	48 33 52	2811	50 8 5	2811	51 42 19	2811
	Aldebaran E.	32 29 18	2696	30 50 16	2619	29 11 37	2629	27 33 22	2649
	Pollux E.	74 59 46	2630	73 21 32	2643	71 43 36	2656	70 5 57	2671
27	α Aquilæ W.	106 34 5	3104	108 2 10	3125	109 29 49	3148	110 51 1	3170
	Fomalhaut W.	78 35 45	2138	80 3 8	2147	81 30 21	2156	82 57 23	2166
	α Pegasi W.	59 32 35	2836	61 6 18	2842	62 39 52	2848	64 13 17	2857
	Pollux E.	62 2 39	2747	60 27 1	2763	58 51 44	2779	57 16 49	2796
	Regulus E.	98 31 31	2666	96 54 5	2676	95 16 56	2690	93 40 3	2704
28	Fomalhaut W.	90 9 25	2224	91 35 6	2228	93 0 30	2252	94 25 38	2267
	α Pegasi W.	71 57 32	2904	73 29 46	2915	71 1 46	2925	76 33 33	2939
	α Arietis W.	28 20 26	2931	29 52 6	2927	31 23 51	2926	32 55 38	2926
	Pollux E.	49 27 59	2680	47 55 26	2690	46 23 19	2681	44 51 39	2682
	Regulus E.	85 40 2	2709	84 4 54	2782	82 30 3	2795	80 55 28	2808
	Venus E.	116 22 9	2865	114 49 7	2881	113 16 24	2897	111 44 1	2911
29	Fomalhaut W.	101 26 40	2360	102 49 54	2360	104 12 46	2387	105 35 17	2405
	α Pegasi W.	84 9 0	2992	85 39 23	3002	87 9 33	3015	88 39 27	3027
	α Arietis W.	40 33 50	2946	42 5 10	2962	43 36 23	2969	45 7 27	2966
	Pollux E.	37 20 33	2678	35 51 57	2109	34 23 58	2140	32 56 37	2176
	Regulus E.	73 6 50	2678	71 33 56	2685	70 1 18	2697	68 28 55	2699
	Venus E.	104 6 40	2992	102 36 5	2997	101 5 48	3010	99 35 48	3024
	Saturn E.	117 9 24	2919	115 37 29	2931	114 5 49	2942	112 34 23	2953
30	α Pegasi W.	96 5 25	3092	97 33 56	3084	99 2 13	3108	100 30 16	3116
	α Arietis W.	52 40 29	3004	54 10 37	3012	55 40 35	3019	57 10 24	3026
	Pollux E.	25 51 47	2416	24 29 49	2485	23 9 8	2566	21 49 57	2668
	Regulus E.	60 50 50	2687	59 19 56	2979	57 49 17	2990	56 18 52	3000
	Venus E.	92 9 55	3088	90 41 31	3101	89 13 22	3111	87 45 26	3123
	Saturn E.	105 0 35	3008	103 30 32	3015	102 0 38	3026	100 30 57	3034
	SUN E.	129 53 35	3214	128 29 40	3224	127 5 56	3235	125 42 25	3245
31	α Arietis W.	64 37 14	2681	66 6 11	2686	67 35 2	2673	69 3 45	2681
	Aldebaran W.	31 18 26	2659	32 47 26	2663	34 16 21	2667	35 45 12	2670
	Regulus E.	48 49 54	2690	47 20 43	2686	45 51 43	2698	44 22 54	2677
	Venus E.	80 29 7	3176	79 2 28	3183	77 35 59	3192	76 9 40	3201
	Saturn E.	93 5 12	3076	91 36 33	3083	90 8 3	3091	88 39 42	3098
	SUN E.	118 47 39	3391	117 25 12	3399	116 2 54	3406	114 40 44	3414

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
<i>Sun.</i>	1	^h 14 ^m 24 ^s 47.26	9.791	S. 14° 22' 19.9"	48.25	16' 9.86"	66.93	^m 16 16.98	^s 0.066
<i>Mon.</i>	2	14 28 42.64	9.825	14 41 31.0	47.66	16 10.10	67.04	16 18.15	0.031
<i>Tues.</i>	3	14 32 38.85	9.860	15 0 27.9	47.06	16 10.34	67.15	16 18.49	0.004
<i>Wed.</i>	4	14 36 35.89	9.895	15 19 10.3	46.44	16 10.58	67.27	16 18.00	0.039
<i>Thur.</i>	5	14 40 33.78	9.930	15 37 37.7	45.81	16 10.82	67.39	16 16.67	0.074
<i>Fri.</i>	6	14 44 32.52	9.965	15 55 49.5	45.15	16 11.05	67.51	16 14.50	0.109
<i>Sat.</i>	7	14 48 32.11	10.001	16 13 45.3	44.48	16 11.28	67.62	16 11.48	0.144
<i>Sun.</i>	8	14 52 32.55	10.036	16 31 24.8	43.79	16 11.51	67.74	16 7.60	0.179
<i>Mon.</i>	9	14 56 33.84	10.072	16 48 47.7	43.09	16 11.74	67.86	16 2.87	0.215
<i>Tues.</i>	10	15 0 36.00	10.108	17 5 53.5	42.36	16 11.97	67.98	15 57.29	0.250
<i>Wed.</i>	11	15 4 39.01	10.143	17 22 41.7	41.62	16 12.19	68.10	15 50.85	0.285
<i>Thur.</i>	12	15 8 42.88	10.178	17 39 11.9	40.86	16 12.41	68.22	15 43.56	0.321
<i>Fri.</i>	13	15 12 47.59	10.213	17 55 23.7	40.09	16 12.63	68.34	15 35.43	0.356
<i>Sat.</i>	14	15 16 53.14	10.248	18 11 16.8	39.30	16 12.85	68.46	15 26.46	0.391
<i>Sun.</i>	15	15 20 59.52	10.282	18 26 50.7	38.49	16 13.07	68.58	15 16.66	0.425
<i>Mon.</i>	16	15 25 6.73	10.317	18 42 5.1	37.67	16 13.28	68.70	15 6.03	0.460
<i>Tues.</i>	17	15 29 14.78	10.351	18 56 59.5	36.83	16 13.49	68.82	14 54.57	0.494
<i>Wed.</i>	18	15 33 23.65	10.385	19 11 33.5	35.97	16 13.70	68.94	14 42.29	0.528
<i>Thur.</i>	19	15 37 33.33	10.418	19 25 46.8	35.10	16 13.91	69.05	14 29.20	0.562
<i>Fri.</i>	20	15 41 43.81	10.451	19 39 39.1	34.21	16 14.11	69.16	14 15.31	0.595
<i>Sat.</i>	21	15 45 55.07	10.484	19 53 10.0	33.31	16 14.31	69.27	14 0.65	0.628
<i>Sun.</i>	22	15 50 7.13	10.517	20 6 19.0	32.40	16 14.50	69.38	13 45.19	0.660
<i>Mon.</i>	23	15 54 19.97	10.549	20 19 5.9	31.47	16 14.69	69.49	13 28.95	0.692
<i>Tues.</i>	24	15 58 33.58	10.581	20 31 30.3	30.52	16 14.87	69.60	13 11.94	0.724
<i>Wed.</i>	25	16 2 47.97	10.613	20 43 31.7	29.56	16 15.05	69.71	12 54.16	0.756
<i>Thur.</i>	26	16 7 3.11	10.644	20 55 9.8	28.59	16 15.22	69.81	12 35.63	0.787
<i>Fri.</i>	27	16 11 19.00	10.675	21 6 24.5	27.60	16 15.39	69.91	12 16.36	0.818
<i>Sat.</i>	28	16 15 35.61	10.705	21 17 15.5	26.60	16 15.55	70.01	11 56.35	0.848
<i>Sun.</i>	29	16 19 52.95	10.735	21 27 42.3	25.59	16 15.71	70.11	11 35.62	0.878
<i>Mon.</i>	30	16 24 10.99	10.764	21 37 44.6	24.57	16 15.86	70.20	11 14.20	0.907
<i>Tues.</i>	31	16 28 29.72	10.792	S. 21 47 22.2	23.53	16 16.01	70.29	10 52.09	0.935

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		^h ^m ^s	^s	[°] ['] ["]	["]	^m ^s	^s	^h ^m ^s
Sun.	1	14 24 49.92	9.791	S. 14 22 33.0	48.25	16 17.00	0.066	14 41 6.92
Mon.	2	14 28 45.31	9.825	14 41 44.0	47.66	16 18.16	0.031	14 45 3.47
Tues.	3	14 32 41.53	9.860	15 0 40.7	47.06	16 18.49	0.004	14 49 0.02
Wed.	4	14 36 38.58	9.895	15 19 22.9	46.44	16 17.99	0.039	14 52 56.57
Thur.	5	14 40 36.48	9.930	15 37 50.1	45.81	16 16.65	0.074	14 56 53.13
Fri.	6	14 44 35.22	9.965	15 56 1.7	45.15	16 14.47	0.109	15 0 49.69
Sat.	7	14 48 34.81	10.001	16 13 57.3	44.48	16 11.43	0.144	15 4 46.24
Sun.	8	14 52 35.25	10.036	16 31 36.6	43.79	16 7.55	0.179	15 8 42.80
Mon.	9	14 56 36.54	10.072	16 48 59.3	43.09	16 2.81	0.214	15 12 39.35
Tues.	10	15 0 38.69	10.108	17 6 4.8	42.36	15 57.22	0.250	15 16 35.91
Wed.	11	15 4 41.69	10.143	17 22 52.7	41.62	15 50.77	0.285	15 20 32.46
Thur.	12	15 8 45.55	10.178	17 39 22.6	40.86	15 43.47	0.321	15 24 29.02
Fri.	13	15 12 50.25	10.213	17 55 34.1	40.09	15 35.33	0.356	15 28 25.58
Sat.	14	15 16 55.78	10.248	18 11 26.9	39.30	15 26.35	0.391	15 32 22.13
Sun.	15	15 21 2.14	10.282	18 27 0.5	38.49	15 16.55	0.425	15 36 18.69
Mon.	16	15 25 9.33	10.317	18 42 14.6	37.67	15 5.91	0.460	15 40 15.24
Tues.	17	15 29 17.35	10.351	18 57 8.7	36.83	14 54.45	0.394	15 44 11.80
Wed.	18	15 33 26.19	10.385	19 11 42.4	35.97	14 42.16	0.528	15 48 8.35
Thur.	19	15 37 35.84	10.418	19 25 55.4	35.10	14 29.07	0.562	15 52 4.91
Fri.	20	15 41 46.29	10.451	19 39 47.3	34.21	14 15.17	0.595	15 56 1.46
Sat.	21	15 45 57.52	10.484	19 53 17.8	33.31	14 0.50	0.628	15 59 58.02
Sun.	22	15 50 9.54	10.517	20 6 26.4	32.40	13 45.04	0.660	16 3 54.58
Mon.	23	15 54 22.34	10.549	20 19 12.9	31.47	13 28.79	0.692	16 7 51.13
Tues.	24	15 58 35.91	10.581	20 31 36.9	30.52	13 11.78	0.724	16 11 47.69
Wed.	25	16 2 50.25	10.613	20 43 38.0	29.56	12 54.00	0.756	16 15 44.25
Thur.	26	16 7 5.34	10.644	20 55 15.8	28.59	12 35.46	0.787	16 19 40.80
Fri.	27	16 11 21.18	10.675	21 6 30.1	27.60	12 16.18	0.818	16 23 37.36
Sat.	28	16 15 37.74	10.705	21 17 20.7	26.60	11 56.18	0.848	16 27 33.92
Sun.	29	16 19 55.02	10.735	21 27 47.2	25.59	11 35.45	0.878	16 31 30.47
Mon.	30	16 24 13.00	10.764	21 37 49.2	24.57	11 14.03	0.907	16 35 27.03
Tues.	31	16 28 31.67	10.792	S. 21 47 26.5	23.53	10 51.91	0.935	16 39 23.58

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	305	218 ^o 35' 49.9	34' 54.3	150.22	+0.04	9.9964621	45.4	9 17 21.52	
2	306	219 35 56.3	35 0.6	150.31	—0.05	.9963537	44.9	9 13 25.61	
3	307	220 36 4.9	35 9.1	150.40	0.11	.9962464	44.4	9 9 29.70	
4	308	221 36 15.7	35 19.8	150.49	0.13	.9961403	43.9	9 5 33.79	
5	309	222 36 28.5	35 32.5	150.58	0.12	.9960352	43.5	9 1 37.89	
6	310	223 36 43.3	35 47.1	150.66	0.09	.9959310	43.1	8 57 41.98	
7	311	224 37 0.0	36 3.7	150.74	—0.02	.9958275	42.8	8 53 46.07	
8	312	225 37 18.7	36 22.3	150.82	+0.07	.9957249	42.5	8 49 50.16	
9	313	226 37 39.4	36 42.9	150.90	0.17	.9956230	42.2	8 45 54.25	
10	314	227 38 1.9	37 5.2	150.97	0.30	.9955220	41.9	8 41 58.35	
11	315	228 38 26.1	37 29.2	151.04	0.45	.9954216	41.6	8 38 2.44	
12	316	229 38 52.0	37 55.0	151.11	0.59	.9953219	41.3	8 34 6.53	
13	317	230 39 19.5	38 22.4	151.18	0.73	.9952230	40.9	8 30 10.62	
14	318	231 39 48.4	38 51.2	151.24	0.85	.9951251	40.5	8 26 14.71	
15	319	232 40 18.7	39 21.3	151.29	0.95	.9950280	40.1	8 22 18.80	
16	320	233 40 50.3	39 52.7	151.35	0.99	.9949321	39.6	8 18 22.89	
17	321	234 41 23.2	40 25.5	151.40	1.03	.9948376	39.0	8 14 26.98	
18	322	235 41 57.3	40 59.5	151.45	1.04	.9947446	38.5	8 10 31.07	
19	323	236 42 32.7	41 34.7	151.50	1.01	.9946528	37.9	8 6 35.16	
20	324	237 43 9.3	42 11.1	151.55	0.97	.9945629	37.1	8 2 39.25	
21	325	238 43 47.0	42 48.6	151.60	0.89	.9944750	36.2	7 58 43.34	
22	326	239 44 25.9	43 27.4	151.65	0.80	.9943890	35.3	7 54 47.43	
23	327	240 45 6.0	44 7.4	151.70	0.68	.9943052	34.4	7 50 51.52	
24	328	241 45 47.4	44 48.7	151.75	0.56	.9942236	33.5	7 46 55.61	
25	329	242 46 30.0	45 31.1	151.80	0.43	.9941443	32.5	7 42 59.71	
26	330	243 47 13.9	46 14.8	151.86	0.30	.9940674	31.5	7 39 3.79	
27	331	244 47 59.1	46 59.9	151.91	0.16	.9939928	30.5	7 35 7.88	
28	332	245 48 45.6	47 46.3	151.97	+0.06	.9939206	29.5	7 31 11.97	
29	333	246 49 33.5	48 34.0	152.03	—0.03	.9938508	28.6	7 27 16.06	
30	334	247 50 22.9	49 23.2	152.09	0.08	.9937834	27.6	7 23 20.14	
31	335	248 51 13.6	50 13.7	152.14	—0.11	9.9937182	26.7	7 19 24.23	

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI- <u>DIAMETER.</u>		HORIZONTAL ^h PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	* Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	14 51.6	14 49.8	54 25.5	-0.65	54 18.9	-0.44	^h 16 ^m 54.9	^m 1.91	^d 19.7
2	14 48.7	14 48.3	54 14.8	-0.24	54 13.3	-0.02	17 40.0	1.84	20.7
3	14 48.6	14 49.6	54 14.4	+0.21	54 18.1	+0.42	18 23.6	1.79	21.7
4	14 51.3	14 53.7	54 24.4	0.63	54 33.4	0.85	19 6.5	1.79	22.7
5	14 56.8	15 0.6	54 44.8	1.05	54 58.5	1.24	19 49.4	1.80	23.7
6	15 4.9	15 9.7	55 14.3	1.40	55 32.0	1.55	20 33.1	1.85	24.7
7	15 15.0	15 20.6	55 51.3	1.67	56 11.9	1.77	21 18.4	1.93	25.7
8	15 26.5	15 32.5	56 33.5	1.83	56 55.5	1.84	22 6.3	2.06	26.7
9	15 38.5	15 44.4	57 17.6	1.83	57 39.3	1.78	22 57.3	2.20	27.7
10	15 50.1	15 55.4	58 0.2	1.70	58 19.9	1.58	23 51.8	2.35	28.7
11	16 0.3	16 4.7	58 38.0	1.43	58 54.1	1.26	^d 0		0.2
12	16 8.5	16 11.6	59 8.0	1.05	59 19.4	0.85	0 49.4	2.46	1.2
13	16 14.0	16 15.7	59 28.3	0.63	59 34.6	0.42	1 48.9	2.50	2.2
14	16 16.7	16 17.1	59 38.3	+0.20	59 39.6	+0.01	2 48.7	2.48	3.2
15	16 16.9	16 16.1	59 38.6	-0.16	59 35.5	-0.34	3 47.2	2.30	4.2
16	16 14.7	16 12.9	59 30.6	0.48	59 24.1	0.60	4 43.3	2.28	5.2
17	16 10.8	16 8.4	59 16.3	0.70	59 7.4	0.78	5 36.8	2.17	6.2
18	16 5.7	16 2.8	58 57.6	0.85	58 47.0	0.92	6 28.0	2.09	7.2
19	15 59.7	15 56.5	58 35.7	0.96	58 23.9	1.00	7 17.6	2.04	8.2
20	15 53.2	15 49.7	58 11.6	1.04	57 58.9	1.08	8 6.6	2.04	9.2
21	15 46.1	15 42.4	57 45.7	1.12	57 32.1	1.15	8 55.7	2.06	10.2
22	15 38.6	15 34.7	57 18.1	1.18	57 3.8	1.21	9 45.4	2.09	11.2
23	15 30.7	15 26.7	56 49.2	1.23	56 34.3	1.25	10 36.1	2.14	12.2
24	15 22.6	15 18.5	56 19.3	1.25	56 4.2	1.25	11 27.6	2.15	13.2
25	15 14.4	15 10.4	55 49.3	1.24	55 34.6	1.20	12 19.2	2.15	14.2
26	15 6.5	15 2.8	55 20.4	1.16	55 6.8	1.10	13 10.3	2.10	15.2
27	14 59.4	14 56.2	54 54.1	1.02	54 42.5	0.92	14 0.1	2.04	16.2
28	14 53.4	14 51.1	54 32.2	0.80	54 23.5	0.66	14 48.1	1.95	17.2
29	14 49.2	14 47.8	54 16.5	0.50	54 11.4	-0.34	15 34.0	1.87	18.2
30	14 47.0	14 46.8	54 8.5	-0.16	54 7.8	+0.04	16 18.2	1.81	19.2
31	14 47.2	14 48.4	54 9.4	+0.24	54 13.6	+0.46	17 1.1	1.77	20.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 1.					TUESDAY 3.				
0	7 4 14.36	2.0892	N.18° 44' 4.6"	5.193	0	8 40 16.62	1.9410	N.13° 12' 44.0"	8.487
1	7 6 18.42	2.0891	18 38 54.2	5.216	1	8 42 13.01	1.9399	13 4 14.9	8.513
2	7 8 22.29	2.0891	18 33 38.8	5.297	2	8 44 9.29	1.9370	12 55 42.5	8.568
3	7 10 25.98	2.0900	18 28 18.5	5.379	3	8 46 5.45	1.9351	12 47 6.8	8.633
4	7 12 29.49	2.0970	18 22 53.3	5.459	4	8 48 1.50	1.9332	12 38 27.8	8.676
5	7 14 32.82	2.0939	18 17 23.3	5.540	5	8 49 57.44	1.9313	12 29 45.6	8.729
6	7 16 35.96	2.0909	18 11 48.5	5.619	6	8 51 53.26	1.9296	12 21 0.3	8.781
7	7 18 38.92	2.0478	18 6 9.0	5.698	7	8 53 48.97	1.9277	12 12 11.8	8.834
8	7 20 41.70	2.0448	18 0 24.7	5.776	8	8 55 44.58	1.9260	12 3 20.2	8.886
9	7 22 44.30	2.0418	17 54 35.7	5.855	9	8 57 40.09	1.9243	11 54 25.5	8.937
10	7 24 46.72	2.0388	17 48 42.1	5.933	10	8 59 35.49	1.9227	11 45 27.8	8.987
11	7 26 48.96	2.0358	17 42 43.8	6.010	11	9 1 30.80	1.9210	11 36 27.0	9.037
12	7 28 51.02	2.0329	17 36 40.9	6.086	12	9 3 26.01	1.9195	11 27 23.3	9.086
13	7 30 52.90	2.0299	17 30 33.5	6.163	13	9 5 21.13	1.9180	11 18 16.6	9.136
14	7 32 54.61	2.0270	17 24 21.5	6.237	14	9 7 16.17	1.9166	11 9 7.0	9.184
15	7 34 56.14	2.0241	17 18 5.0	6.313	15	9 9 11.12	1.9151	10 59 54.4	9.233
16	7 36 57.50	2.0212	17 11 44.1	6.386	16	9 11 5.98	1.9137	10 50 39.0	9.280
17	7 38 58.69	2.0183	17 5 18.7	6.460	17	9 13 0.76	1.9123	10 41 20.8	9.327
18	7 40 59.70	2.0155	16 58 49.0	6.531	18	9 14 55.46	1.9111	10 31 59.7	9.374
19	7 43 0.54	2.0136	16 52 14.9	6.604	19	9 16 50.09	1.9098	10 22 35.8	9.421
20	7 45 1.21	2.0096	16 45 36.5	6.676	20	9 18 44.64	1.9087	10 13 9.2	9.466
21	7 47 1.71	2.0070	16 38 53.8	6.748	21	9 20 39.12	1.9078	10 3 39.8	9.512
22	7 49 2.05	2.0047	16 32 6.8	6.817	22	9 22 33.54	1.9064	9 54 7.8	9.556
23	7 51 2.22	2.0016	N.16 25 15.6	6.887	23	9 24 27.88	1.9052	N. 9 44 33.1	9.600
MONDAY 2.					WEDNESDAY 4.				
0	7 53 2.23	1.9987	N.16 18 20.3	6.956	0	9 26 22.16	1.9043	N. 9 34 55.9	9.643
1	7 55 2.07	1.9969	16 11 20.8	7.026	1	9 28 16.38	1.9033	9 25 16.1	9.685
2	7 57 1.74	1.9953	16 4 17.2	7.094	2	9 30 10.54	1.9023	9 15 33.7	9.727
3	7 59 1.25	1.9906	15 57 9.5	7.163	3	9 32 4.65	1.9014	9 5 48.8	9.769
4	8 1 0.60	1.9879	15 49 57.8	7.229	4	9 33 58.71	1.9006	8 56 1.4	9.809
5	8 2 59.79	1.9852	15 42 42.0	7.296	5	9 35 52.72	1.8998	8 46 11.6	9.849
6	8 4 58.83	1.9827	15 35 22.3	7.361	6	9 37 46.68	1.8991	8 36 19.4	9.890
7	8 6 57.71	1.9801	15 27 58.6	7.427	7	9 39 40.60	1.8983	8 26 24.8	9.930
8	8 8 56.44	1.9776	15 20 31.0	7.492	8	9 41 34.48	1.8978	8 16 27.8	9.968
9	8 10 55.01	1.9750	15 12 59.5	7.557	9	9 43 28.33	1.8973	8 6 28.5	10.007
10	8 12 53.44	1.9726	15 5 24.2	7.620	10	9 45 22.14	1.8967	7 56 27.0	10.044
11	8 14 51.72	1.9701	14 57 45.0	7.684	11	9 47 15.92	1.8961	7 46 23.2	10.082
12	8 16 49.85	1.9676	14 50 2.1	7.746	12	9 49 9.67	1.8957	7 36 17.2	10.118
13	8 18 47.83	1.9651	14 42 15.4	7.809	13	9 51 3.40	1.8953	7 26 9.0	10.156
14	8 20 45.66	1.9628	14 34 25.0	7.870	14	9 52 57.10	1.8950	7 15 58.6	10.190
15	8 22 43.36	1.9606	14 26 30.9	7.932	15	9 54 50.78	1.8946	7 5 46.1	10.225
16	8 24 40.93	1.9583	14 18 33.2	7.993	16	9 56 44.45	1.8944	6 55 31.5	10.260
17	8 26 38.35	1.9560	14 10 31.8	8.053	17	9 58 38.10	1.8941	6 45 14.9	10.294
18	8 28 35.64	1.9537	14 2 26.8	8.113	18	10 0 31.74	1.8940	6 34 56.2	10.327
19	8 30 32.79	1.9514	13 54 18.5	8.170	19	10 2 25.38	1.8939	6 24 35.5	10.361
20	8 32 29.81	1.9492	13 46 6.5	8.228	20	10 4 19.01	1.8939	6 14 12.9	10.393
21	8 34 26.70	1.9471	13 37 51.0	8.287	21	10 6 12.64	1.8938	6 3 48.3	10.426
22	8 36 23.46	1.9450	13 29 32.1	8.344	22	10 8 6.27	1.8940	5 53 21.9	10.456
23	8 38 20.10	1.9430	13 21 9.7	8.401	23	10 9 59.91	1.8941	5 42 53.6	10.487
24	8 40 16.62	1.9410	N.13 12 44.0	8.457	24	10 11 53.55	1.8943	N. 5 32 23.4	10.517

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 5.					SATURDAY 7.				
0	10 11 53.55	1.8943	N. 5 32 23.4	10.517	0	11 44 2.75	1.9672	S. 3 15 32.7	11.226
1	10 13 47.21	1.8944	5 21 51.5	10.547	1	11 46 0.86	1.9699	3 26 46.1	11.222
2	10 15 40.88	1.8947	5 11 17.8	10.576	2	11 47 59.14	1.9729	3 37 59.3	11.218
3	10 17 34.56	1.8949	5 0 42.4	10.608	3	11 49 57.60	1.9759	3 49 12.3	11.214
4	10 19 28.27	1.8954	4 50 5.4	10.630	4	11 51 56.25	1.9790	4 0 25.0	11.209
5	10 21 22.01	1.8958	4 39 26.7	10.656	5	11 53 55.08	1.9821	4 11 37.4	11.203
6	10 23 15.77	1.8963	4 28 46.4	10.686	6	11 55 54.10	1.9853	4 22 49.4	11.196
7	10 25 9.56	1.8968	4 18 4.5	10.712	7	11 57 53.31	1.9884	4 34 0.9	11.188
8	10 27 3.39	1.8973	4 7 21.0	10.737	8	11 59 52.72	1.9918	4 45 12.0	11.180
9	10 28 57.26	1.8983	3 56 36.0	10.768	9	12 1 52.32	1.9961	4 56 22.5	11.171
10	10 30 51.17	1.8989	3 45 49.5	10.796	10	12 3 52.13	1.9986	5 7 32.5	11.160
11	10 32 45.13	1.8997	3 35 1.6	10.810	11	12 5 52.14	2.0019	5 18 41.8	11.149
12	10 34 39.13	1.9006	3 24 12.3	10.833	12	12 7 52.36	2.0064	5 29 50.4	11.136
13	10 36 33.18	1.9013	3 13 21.6	10.856	13	12 9 52.79	2.0089	5 40 58.3	11.124
14	10 38 27.29	1.9023	3 2 29.6	10.877	14	12 11 53.43	2.0126	5 52 5.3	11.109
15	10 40 21.45	1.9032	2 51 36.3	10.898	15	12 13 54.29	2.0162	6 3 11.5	11.096
16	10 42 15.67	1.9043	2 40 41.8	10.918	16	12 15 55.37	2.0199	6 14 16.7	11.079
17	10 44 9.96	1.9063	2 29 46.0	10.939	17	12 17 56.67	2.0236	6 25 21.0	11.063
18	10 46 4.31	1.9065	2 18 49.1	10.968	18	12 19 58.20	2.0274	6 36 24.2	11.044
19	10 47 58.73	1.9077	2 7 51.0	10.977	19	12 21 59.96	2.0312	6 47 26.3	11.026
20	10 49 53.23	1.9090	1 56 51.8	10.996	20	12 24 1.94	2.0352	6 58 27.2	11.006
21	10 51 47.80	1.9102	1 45 51.5	11.013	21	12 26 4.17	2.0391	7 9 26.9	10.986
22	10 53 42.45	1.9116	1 34 50.2	11.029	22	12 28 6.63	2.0431	7 20 25.4	10.963
23	10 55 37.19	1.9130	N. 1 23 47.9	11.046	23	12 30 9.33	2.0471	S. 7 31 22.5	10.941
FRIDAY 6.					SUNDAY 8.				
0	10 57 32.01	1.9146	N. 1 12 44.7	11.061	0	12 32 12.28	2.0513	S. 7 42 18.3	10.917
1	10 59 26.92	1.9160	1 1 40.5	11.077	1	12 34 15.48	2.0554	7 53 12.6	10.899
2	11 1 21.93	1.9176	0 50 35.5	11.091	2	12 36 18.93	2.0596	8 4 5.4	10.887
3	11 3 17.03	1.9192	0 39 29.6	11.106	3	12 38 22.63	2.0638	8 14 56.7	10.841
4	11 5 12.24	1.9210	0 28 22.9	11.117	4	12 40 26.59	2.0682	8 25 46.3	10.813
5	11 7 7.55	1.9228	0 17 15.5	11.130	5	12 42 30.81	2.0726	8 36 34.2	10.784
6	11 9 2.97	1.9246	N. 0 6 7.3	11.141	6	12 44 35.29	2.0769	8 47 20.4	10.754
7	11 10 58.50	1.9264	S. 0 5 1.6	11.153	7	12 46 40.03	2.0813	8 58 4.8	10.734
8	11 12 54.14	1.9284	0 16 11.1	11.163	8	12 48 45.04	2.0866	9 8 47.3	10.692
9	11 14 49.90	1.9304	0 27 21.2	11.173	9	12 50 50.32	2.0903	9 19 27.9	10.659
10	11 16 45.79	1.9326	0 38 31.8	11.181	10	12 52 55.87	2.0948	9 30 6.4	10.626
11	11 18 41.80	1.9346	0 49 42.9	11.189	11	12 55 1.69	2.0993	9 40 42.9	10.590
12	11 20 37.94	1.9367	1 0 54.5	11.196	12	12 57 7.79	2.1040	9 51 17.2	10.564
13	11 22 34.20	1.9388	1 12 6.5	11.203	13	12 59 14.17	2.1088	10 1 49.3	10.517
14	11 24 30.60	1.9412	1 23 18.9	11.208	14	13 1 20.84	2.1136	10 12 19.2	10.478
15	11 26 27.14	1.9435	1 34 31.6	11.213	15	13 3 27.80	2.1183	10 22 46.7	10.438
16	11 28 23.82	1.9459	1 45 44.5	11.217	16	13 5 35.04	2.1231	10 33 11.8	10.397
17	11 30 20.65	1.9483	1 56 57.7	11.222	17	13 7 42.57	2.1279	10 43 34.4	10.366
18	11 32 17.62	1.9508	2 8 11.1	11.224	18	13 9 50.39	2.1328	10 53 54.5	10.312
19	11 34 14.74	1.9533	2 19 24.6	11.226	19	13 11 58.50	2.1377	11 4 11.9	10.268
20	11 36 12.02	1.9559	2 30 38.2	11.226	20	13 14 6.91	2.1427	11 14 26.7	10.222
21	11 38 9.45	1.9586	2 41 51.9	11.227	21	13 16 15.62	2.1477	11 24 38.7	10.177
22	11 40 7.05	1.9614	2 53 5.5	11.227	22	13 18 24.63	2.1527	11 34 47.9	10.128
23	11 42 4.81	1.9642	3 4 19.1	11.227	23	13 20 33.94	2.1577	11 44 54.2	10.080
24	11 44 2.75	1.9672	S. 3 15 32.7	11.226	24	13 22 43.55	2.1628	S. 11 54 57.5	10.029

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 9.					WEDNESDAY 11.				
0	13 22 43.55	2.1628	S. 11° 54' 57.5"	10.029	0	15 12 41.08	2.4172	S. 18° 35' 4.4"	2.184
1	13 24 53.47	2.1679	12 4 57.8	9.979	1	15 15 6.26	2.4221	18 41 10.3	6.043
2	13 27 3.70	2.1731	12 14 55.0	9.926	2	15 17 31.73	2.4268	18 47 9.6	5.981
3	13 29 14.24	2.1788	12 24 49.0	9.873	3	15 19 57.48	2.4316	18 53 2.1	5.918
4	13 31 25.09	2.1835	12 34 39.7	9.817	4	15 22 23.52	2.4362	18 58 47.8	5.763
5	13 33 36.25	2.1887	12 44 27.1	9.762	5	15 24 49.83	2.4408	19 4 26.5	5.587
6	13 35 47.73	2.1940	12 54 11.1	9.704	6	15 27 16.42	2.4453	19 9 58.3	5.470
7	13 37 59.52	2.1992	13 3 51.6	9.646	7	15 29 43.28	2.4499	19 15 23.0	5.368
8	13 40 11.63	2.2046	13 13 28.6	9.585	8	15 32 10.41	2.4543	19 20 40.6	5.284
9	13 42 24.06	2.2099	13 23 1.9	9.525	9	15 34 37.81	2.4588	19 25 51.1	5.114
10	13 44 36.81	2.2152	13 32 31.6	9.463	10	15 37 5.46	2.4630	19 30 54.3	4.993
11	13 46 49.88	2.2205	13 41 57.5	9.400	11	15 39 33.37	2.4673	19 35 50.2	4.871
12	13 49 3.27	2.2259	13 51 19.6	9.336	12	15 42 1.53	2.4714	19 40 38.8	4.748
13	13 51 16.99	2.2312	14 0 37.8	9.269	13	15 44 29.94	2.4756	19 45 20.0	4.624
14	13 53 31.03	2.2367	14 9 51.9	9.201	14	15 46 58.60	2.4795	19 49 53.7	4.499
15	13 55 45.39	2.2421	14 19 1.9	9.133	15	15 49 27.49	2.4836	19 54 19.8	4.373
16	13 58 0.08	2.2476	14 28 7.8	9.063	16	15 51 56.62	2.4873	19 58 38.4	4.246
17	14 0 15.10	2.2530	14 37 9.4	8.992	17	15 54 25.98	2.4912	20 2 49.3	4.117
18	14 2 30.44	2.2584	14 46 6.8	8.919	18	15 56 55.56	2.4948	20 6 52.5	3.988
19	14 4 46.11	2.2638	14 54 59.8	8.846	19	15 59 25.36	2.4985	20 10 48.0	3.860
20	14 7 2.10	2.2693	15 3 48.3	8.770	20	16 1 55.38	2.5020	20 14 35.7	3.729
21	14 9 18.42	2.2748	15 12 32.3	8.694	21	16 4 25.61	2.5055	20 18 15.5	3.598
22	14 11 35.07	2.2803	15 21 11.6	8.616	22	16 6 56.04	2.5088	20 21 47.5	3.466
23	14 13 52.04	2.2858	S. 15° 29' 46.2"	8.537	23	16 9 26.67	2.5122	S. 20° 25' 11.5"	3.333
TUESDAY 10.					THURSDAY 12.				
0	14 16 9.34	2.2911	S. 15° 38' 16.1"	8.497	0	16 11 57.50	2.5158	S. 20° 28' 27.5"	3.199
1	14 18 26.98	2.2967	15 46 41.1	8.376	1	16 14 28.51	2.5184	20 31 35.4	3.066
2	14 20 44.94	2.3021	15 55 1.2	8.293	2	16 16 59.71	2.5213	20 34 35.3	2.930
3	14 23 3.23	2.3076	16 3 16.3	8.210	3	16 19 31.08	2.5243	20 37 27.1	2.796
4	14 25 21.85	2.3130	16 11 26.4	8.124	4	16 22 2.63	2.5272	20 40 10.7	2.668
5	14 27 40.79	2.3184	16 19 31.3	8.038	5	16 24 34.34	2.5298	20 42 46.1	2.521
6	14 30 0.06	2.3238	16 27 31.0	7.950	6	16 27 6.21	2.5324	20 45 13.2	2.363
7	14 32 19.65	2.3292	16 35 25.4	7.862	7	16 29 38.24	2.5350	20 47 32.1	2.246
8	14 34 39.56	2.3346	16 43 14.4	7.771	8	16 32 10.41	2.5374	20 49 42.6	2.106
9	14 36 59.80	2.3399	16 50 58.0	7.680	9	16 34 42.73	2.5398	20 51 44.7	1.966
10	14 39 20.35	2.3453	16 58 36.0	7.587	10	16 37 15.18	2.5419	20 53 38.5	1.836
11	14 41 41.22	2.3505	17 6 8.4	7.493	11	16 39 47.76	2.5440	20 55 23.9	1.696
12	14 44 2.41	2.3559	17 13 35.1	7.397	12	16 42 20.46	2.5460	20 57 0.8	1.544
13	14 46 23.93	2.3613	17 20 56.0	7.300	13	16 44 53.28	2.5480	20 58 29.2	1.403
14	14 48 45.76	2.3666	17 28 11.1	7.202	14	16 47 26.22	2.5498	20 59 49.2	1.261
15	14 51 7.91	2.3718	17 35 20.3	7.108	15	16 49 59.26	2.5514	21 1 0.7	1.120
16	14 53 30.38	2.3770	17 42 23.5	7.002	16	16 52 32.39	2.5529	21 2 3.6	0.977
17	14 55 53.16	2.3822	17 49 20.6	6.901	17	16 55 5.62	2.5545	21 3 58.0	0.836
18	14 58 16.24	2.3873	17 56 11.6	6.797	18	16 57 38.93	2.5560	21 3 43.8	0.691
19	15 0 39.63	2.3928	18 2 56.3	6.693	19	17 0 12.32	2.5571	21 4 21.0	0.548
20	15 3 3.32	2.3978	18 9 34.8	6.588	20	17 2 45.78	2.5582	21 4 49.6	0.404
21	15 5 27.32	2.4034	18 16 6.9	6.482	21	17 5 19.31	2.5593	21 5 9.6	0.262
22	15 7 51.61	2.4074	18 22 32.6	6.373	22	17 7 52.90	2.5601	21 5 21.0	0.118
23	15 10 16.20	2.4123	18 28 51.8	6.265	23	17 10 26.54	2.5610	21 5 23.8	0.036
24	15 12 41.08	2.4172	S. 18° 35' 4.4"	6.154	24	17 13 0.22	2.5616	S. 21° 5' 17.9"	0.179

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
FRIDAY 13.					SUNDAY 15.				
0	17 13 0.22	2.5616	S. 21° 5' 17.9	9.170	0	19 14 47.71	2.4782	S. 18° 15' 15.9	6.701
1	17 15 33.94	2.5623	21 5 3.3	9.316	1	19 17 16.29	2.4745	18 8 30.2	6.920
2	17 18 7.69	2.5627	21 4 40.1	9.450	2	19 19 44.65	2.4709	18 1 37.5	6.936
3	17 20 41.47	2.5631	21 4 8.2	9.603	3	19 22 12.79	2.4672	17 54 37.8	7.063
4	17 23 15.26	2.5633	21 3 27.7	9.748	4	19 24 40.71	2.4634	17 47 31.2	7.167
5	17 25 49.07	2.5636	21 2 38.4	9.893	5	19 27 8.40	2.4596	17 40 17.7	7.282
6	17 28 22.88	2.5638	21 1 40.5	1.097	6	19 29 35.86	2.4558	17 32 57.4	7.393
7	17 30 56.69	2.5635	21 0 33.9	1.193	7	19 32 3.10	2.4520	17 25 30.4	7.506
8	17 33 30.50	2.5633	20 59 18.7	1.326	8	19 34 30.10	2.4481	17 17 56.8	7.614
9	17 36 4.29	2.5630	20 57 54.8	1.471	9	19 36 56.87	2.4442	17 10 16.6	7.734
10	17 38 38.06	2.5626	20 56 22.2	1.614	10	19 39 23.40	2.4402	17 2 29.9	7.831
11	17 41 11.81	2.5623	20 54 41.0	1.768	11	19 41 49.70	2.4362	16 54 36.7	7.989
12	17 43 45.52	2.5614	20 52 51.2	1.901	12	19 44 15.75	2.4321	16 46 37.2	8.043
13	17 46 19.19	2.5607	20 50 52.8	2.045	13	19 46 41.55	2.4280	16 38 31.4	8.148
14	17 48 52.81	2.5600	20 48 45.8	2.198	14	19 49 7.11	2.4239	16 30 19.4	8.261
15	17 51 26.38	2.5591	20 46 30.2	2.331	15	19 51 32.42	2.4198	16 22 1.2	8.354
16	17 53 59.90	2.5580	20 44 6.1	2.473	16	19 53 57.49	2.4156	16 13 36.9	8.454
17	17 56 33.35	2.5568	20 41 33.4	2.616	17	19 56 22.31	2.4117	16 5 6.6	8.554
18	17 59 6.73	2.5555	20 38 52.3	2.768	18	19 58 46.89	2.4076	15 56 30.4	8.652
19	18 1 40.03	2.5543	20 36 2.7	2.898	19	20 1 11.21	2.4033	15 47 48.3	8.760
20	18 4 13.35	2.5528	20 33 4.6	3.038	20	20 3 35.29	2.3992	15 39 0.4	8.846
21	18 6 46.38	2.5514	20 29 58.1	3.178	21	20 5 59.11	2.3950	15 30 6.8	8.940
22	18 9 19.42	2.5497	20 26 43.2	3.317	22	20 8 22.69	2.3908	15 21 7.6	9.033
23	18 11 52.35	2.5480	S. 20° 23' 19.9	3.467	23	20 10 46.03	2.3867	S. 15° 12' 2.8	9.126
SATURDAY 14.					MONDAY 16.				
0	18 14 25.18	2.5461	S. 20° 19' 48.3	3.595	0	20 13 9.11	2.3828	S. 15° 2' 52.5	9.216
1	18 16 57.89	2.5442	20 16 8.4	3.784	1	20 15 31.93	2.3789	14 53 36.8	9.306
2	18 19 30.48	2.5423	20 12 20.2	3.971	2	20 17 54.49	2.3740	14 44 15.8	9.394
3	18 22 2.95	2.5401	20 8 23.8	4.098	3	20 20 16.80	2.3698	14 34 49.5	9.482
4	18 24 35.29	2.5378	20 4 19.2	4.144	4	20 22 38.87	2.3657	14 25 18.0	9.567
5	18 27 7.49	2.5356	20 0 6.4	4.261	5	20 25 0.68	2.3616	14 15 41.4	9.652
6	18 29 39.56	2.5332	19 55 45.5	4.416	6	20 27 22.25	2.3574	14 5 59.8	9.734
7	18 32 11.48	2.5308	19 51 16.6	4.549	7	20 29 43.57	2.3533	13 56 13.2	9.817
8	18 34 43.26	2.5282	19 46 39.6	4.682	8	20 32 4.64	2.3492	13 46 21.7	9.897
9	18 37 14.88	2.5257	19 41 54.6	4.816	9	20 34 25.46	2.3450	13 36 25.4	9.977
10	18 39 46.34	2.5230	19 37 1.7	4.947	10	20 36 46.04	2.3409	13 26 24.4	10.054
11	18 42 17.64	2.5203	19 32 0.9	5.079	11	20 39 6.36	2.3367	13 16 18.8	10.132
12	18 44 48.77	2.5173	19 26 52.2	5.208	12	20 41 26.44	2.3326	13 6 8.6	10.207
13	18 47 19.72	2.5144	19 21 35.8	5.336	13	20 43 46.27	2.3284	12 55 53.9	10.282
14	18 49 50.50	2.5114	19 16 11.6	5.466	14	20 46 5.85	2.3244	12 45 34.8	10.354
15	18 52 21.09	2.5083	19 10 39.7	5.596	15	20 48 25.19	2.3203	12 35 11.4	10.426
16	18 54 51.50	2.5052	19 5 0.2	5.721	16	20 50 44.29	2.3163	12 24 43.7	10.496
17	18 57 21.72	2.5021	18 59 13.1	5.847	17	20 53 3.15	2.3123	12 14 11.8	10.566
18	18 59 51.75	2.4988	18 53 18.5	5.973	18	20 55 21.77	2.3084	12 3 35.8	10.632
19	19 2 21.58	2.4956	18 47 16.4	6.097	19	20 57 40.14	2.3044	11 52 55.8	10.699
20	19 4 51.22	2.4923	18 41 6.9	6.219	20	20 59 58.28	2.3006	11 42 11.9	10.763
21	19 7 20.65	2.4888	18 34 50.0	6.343	21	21 2 16.19	2.2967	11 31 24.1	10.828
22	19 9 49.88	2.4853	18 28 25.9	6.463	22	21 4 33.86	2.2929	11 20 32.5	10.890
23	19 12 18.90	2.4819	18 21 54.5	6.583	23	21 6 51.30	2.2889	11 9 37.2	10.952
24	19 14 47.71	2.4782	S. 18° 15' 15.9	6.701	24	21 9 8.51	2.2851	S. 10° 58' 38.3	11.011

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 17.					THURSDAY 19.				
0	21 9 8.51	2.3851	S. 10 58 38.3	11.011	0	22 55 14.65	2.1548	S. 1 24 48.7	12.422
1	21 11 25.50	2.3813	10 47 35.8	11.070	1	22 57 23.90	2.1535	1 12 22.7	12.433
2	21 13 42.26	2.3776	10 36 29.9	11.127	2	22 59 33.07	2.1522	0 59 56.7	12.432
3	21 15 58.80	2.3738	10 25 20.5	11.184	3	23 1 42.15	2.1508	0 47 30.8	12.431
4	21 18 15.12	2.3702	10 14 7.8	11.238	4	23 3 51.16	2.1493	0 35 5.0	12.428
5	21 20 31.22	2.3666	10 2 51.8	11.293	5	23 6 0.09	2.1482	0 22 39.4	12.426
6	21 22 47.11	2.3630	9 51 32.7	11.344	6	23 8 8.94	2.1470	S. 0 10 14.0	12.419
7	21 25 2.78	2.3594	9 40 10.5	11.396	7	23 10 17.73	2.1459	N. 0 2 11.0	12.413
8	21 27 18.24	2.3558	9 28 45.2	11.445	8	23 12 26.45	2.1449	0 14 35.6	12.406
9	21 29 33.49	2.3524	9 17 17.0	11.494	9	23 14 35.10	2.1438	0 26 59.8	12.398
10	21 31 48.53	2.3490	9 5 45.9	11.540	10	23 16 43.70	2.1429	0 39 23.4	12.388
11	21 34 3.37	2.3457	8 54 12.1	11.587	11	23 18 52.24	2.1419	0 51 46.4	12.378
12	21 36 18.01	2.3423	8 42 35.5	11.631	12	23 21 0.73	2.1411	1 4 8.8	12.366
13	21 38 32.44	2.3389	8 30 56.3	11.675	13	23 23 9.17	2.1403	1 16 30.4	12.354
14	21 40 46.68	2.3357	8 19 14.5	11.716	14	23 25 17.56	2.1396	1 28 51.3	12.341
15	21 43 0.73	2.3325	8 7 30.2	11.758	15	23 27 25.91	2.1388	1 41 11.3	12.327
16	21 45 14.58	2.3294	7 55 43.5	11.797	16	23 29 34.22	2.1383	1 53 30.5	12.311
17	21 47 28.24	2.3262	7 43 54.4	11.837	17	23 31 42.50	2.1377	2 5 48.7	12.294
18	21 49 41.72	2.3232	7 32 3.1	11.873	18	23 33 50.74	2.1372	2 18 5.8	12.276
19	21 51 55.02	2.3201	7 20 9.6	11.909	19	23 35 58.96	2.1367	2 30 21.8	12.257
20	21 54 8.13	2.3171	7 8 14.0	11.944	20	23 38 7.15	2.1363	2 42 36.7	12.237
21	21 56 21.06	2.3141	6 56 16.3	11.978	21	23 40 15.32	2.1359	2 54 50.3	12.217
22	21 58 33.82	2.3113	6 44 16.7	12.009	22	23 42 23.46	2.1357	3 7 2.7	12.194
23	22 0 46.41	2.3084	S. 6 32 15.2	12.041	23	23 44 31.59	2.1354	N. 3 19 13.7	12.171
WEDNESDAY 18.					FRIDAY 20.				
0	22 2 58.83	2.3057	S. 6 20 11.8	12.070	0	23 46 39.71	2.1352	N. 3 31 23.2	12.146
1	22 5 11.09	2.3030	6 8 6.7	12.099	1	23 48 47.81	2.1350	3 43 31.3	12.122
2	22 7 23.19	2.3004	5 55 59.9	12.126	2	23 50 55.91	2.1349	3 55 37.8	12.094
3	22 9 35.13	2.1977	5 43 51.5	12.153	3	23 53 4.00	2.1348	4 7 42.7	12.067
4	22 11 46.91	2.1952	5 31 41.5	12.178	4	23 55 12.09	2.1349	4 19 45.9	12.038
5	22 13 58.54	2.1928	5 19 30.1	12.203	5	23 57 20.18	2.1349	4 31 47.4	12.010
6	22 16 10.02	2.1902	5 7 17.2	12.224	6	23 59 28.28	2.1350	4 43 47.1	11.979
7	22 18 21.35	2.1877	4 55 3.1	12.246	7	0 1 36.38	2.1351	4 55 45.0	11.948
8	22 20 32.54	2.1853	4 42 47.7	12.265	8	0 3 44.48	2.1352	5 7 40.9	11.915
9	22 22 43.58	2.1829	4 30 31.2	12.285	9	0 5 52.58	2.1352	5 19 34.9	11.883
10	22 24 54.49	2.1807	4 18 13.5	12.302	10	0 8 0.69	2.1354	5 31 26.8	11.848
11	22 27 5.26	2.1786	4 5 54.8	12.320	11	0 10 8.81	2.1357	5 43 16.6	11.812
12	22 29 15.91	2.1764	3 53 35.1	12.336	12	0 12 16.95	2.1360	5 55 4.2	11.774
13	22 31 26.43	2.1743	3 41 14.5	12.350	13	0 14 25.12	2.1364	6 6 49.6	11.739
14	22 33 36.83	2.1723	3 28 53.1	12.362	14	0 16 33.32	2.1369	6 18 32.7	11.700
15	22 35 47.10	2.1703	3 16 30.9	12.375	15	0 18 41.55	2.1372	6 30 13.5	11.660
16	22 37 57.26	2.1684	3 4 8.1	12.386	16	0 20 49.80	2.1378	6 41 51.9	11.618
17	22 40 7.30	2.1664	2 51 44.6	12.396	17	0 22 58.08	2.1383	6 53 27.8	11.577
18	22 42 17.23	2.1646	2 39 20.6	12.404	18	0 25 6.40	2.1389	7 5 1.2	11.534
19	22 44 27.05	2.1628	2 26 56.1	12.419	19	0 27 14.75	2.1395	7 16 32.0	11.492
20	22 46 36.77	2.1611	2 14 31.2	12.417	20	0 29 23.14	2.1401	7 28 0.2	11.447
21	22 48 46.38	2.1604	2 2 5.9	12.423	21	0 31 31.57	2.1408	7 39 25.7	11.402
22	22 50 55.90	2.1578	1 49 40.4	12.427	22	0 33 40.04	2.1415	7 50 48.4	11.356
23	22 53 5.32	2.1562	1 37 14.6	12.431	23	0 35 48.56	2.1423	8 2 8.4	11.308
24	22 55 14.65	2.1548	S. 1 24 48.7	12.433	24	0 37 57.12	2.1432	N. 8 13 25.5	11.266

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 21.					MONDAY 23.				
0	^h 0 ^m 37 ^s 57.12	2.1492	N. 8° 13' 25.5"	11.366	0	^h 2 ^m 22 ^s 13.48	2.2066	N. 16° 0' 41.2"	7.861
1	0 40 5.74	2.1441	8 24 39.5	11.300	1	2 24 25.92	2.2061	16 8 31.4	7.792
2	0 42 14.41	2.1480	8 35 50.6	11.166	2	2 26 38.45	2.2066	16 16 16.2	7.701
3	0 44 23.13	2.1466	8 46 58.6	11.106	3	2 28 51.06	2.2109	16 23 55.5	7.609
4	0 46 31.91	2.1466	8 58 3.6	11.066	4	2 31 3.76	2.2122	16 31 29.3	7.516
5	0 48 40.75	2.1478	9 9 5.4	11.008	5	2 33 16.54	2.2137	16 38 57.5	7.424
6	0 50 49.64	2.1488	9 20 3.9	10.968	6	2 35 29.40	2.2160	16 46 20.2	7.330
7	0 52 58.59	2.1496	9 30 59.2	10.893	7	2 37 42.34	2.2164	16 53 37.3	7.237
8	0 55 7.61	2.1509	9 41 51.1	10.837	8	2 39 55.37	2.2177	17 0 48.7	7.143
9	0 57 16.69	2.1519	9 52 39.7	10.781	9	2 42 8.48	2.2191	17 7 54.4	7.047
10	0 59 25.84	2.1530	10 3 24.8	10.723	10	2 44 21.66	2.2203	17 14 54.4	6.961
11	1 1 35.05	2.1541	10 14 6.4	10.664	11	2 46 34.92	2.2216	17 21 48.6	6.866
12	1 3 44.33	2.1553	10 24 44.5	10.604	12	2 48 48.25	2.2228	17 28 37.0	6.768
13	1 5 53.69	2.1566	10 35 19.0	10.544	13	2 51 1.66	2.2241	17 35 19.6	6.661
14	1 8 3.12	2.1579	10 45 49.8	10.482	14	2 53 15.14	2.2252	17 41 56.3	6.563
15	1 10 12.63	2.1591	10 56 16.9	10.420	15	2 55 28.69	2.2263	17 48 27.1	6.464
16	1 12 22.21	2.1604	11 6 40.2	10.357	16	2 57 42.30	2.2274	17 54 52.0	6.364
17	1 14 31.87	2.1616	11 16 59.7	10.293	17	2 59 55.98	2.2286	18 1 10.9	6.265
18	1 16 41.60	2.1629	11 27 15.3	10.227	18	3 2 9.73	2.2296	18 7 23.8	6.165
19	1 18 51.41	2.1642	11 37 26.9	10.161	19	3 4 23.54	2.2307	18 13 30.7	6.065
20	1 21 1.30	2.1655	11 47 34.6	10.094	20	3 6 37.41	2.2317	18 19 31.6	5.963
21	1 23 11.27	2.1668	11 57 38.2	10.026	21	3 8 51.34	2.2327	18 25 26.4	5.862
22	1 25 21.32	2.1682	12 7 37.7	9.957	22	3 11 5.33	2.2336	18 31 15.0	5.769
23	1 27 31.45	2.1696	N. 12° 17' 33.1"	9.888	23	3 13 19.38	2.2346	N. 18° 36' 57.5"	5.667
SUNDAY 22.					TUESDAY 24.				
0	1 29 41.66	2.1710	N. 12° 27' 24.2"	9.818	0	3 15 33.48	2.2354	N. 18° 42' 33.8"	5.563
1	1 31 51.97	2.1726	12 37 11.2	9.747	1	3 17 47.63	2.2363	18 48 3.9	5.460
2	1 34 2.36	2.1740	12 46 53.8	9.674	2	3 20 1.83	2.2370	18 53 27.8	5.346
3	1 36 12.84	2.1764	12 56 32.1	9.601	3	3 22 16.08	2.2376	18 58 45.4	5.242
4	1 38 23.41	2.1769	13 6 5.9	9.528	4	3 24 30.37	2.2386	19 3 56.8	5.137
5	1 40 34.06	2.1782	13 15 35.3	9.452	5	3 26 44.71	2.2393	19 9 1.8	5.032
6	1 42 44.80	2.1797	13 25 0.1	9.376	6	3 28 59.08	2.2398	19 14 0.6	4.926
7	1 44 55.63	2.1813	13 34 20.4	9.300	7	3 31 13.49	2.2404	19 18 53.0	4.821
8	1 47 6.55	2.1827	13 43 36.1	9.222	8	3 33 27.93	2.2409	19 23 39.1	4.714
9	1 49 17.56	2.1842	13 52 47.1	9.143	9	3 35 42.41	2.2416	19 28 18.8	4.606
10	1 51 28.65	2.1856	14 1 53.3	9.064	10	3 37 56.91	2.2418	19 32 52.1	4.501
11	1 53 39.83	2.1871	14 10 54.8	8.985	11	3 40 11.44	2.2424	19 37 19.0	4.394
12	1 55 51.10	2.1886	14 19 51.5	8.904	12	3 42 26.00	2.2428	19 41 39.4	4.286
13	1 58 2.47	2.1903	14 28 43.3	8.823	13	3 44 40.58	2.2433	19 45 53.4	4.179
14	2 0 13.94	2.1918	14 37 30.3	8.741	14	3 46 55.18	2.2434	19 50 0.9	4.071
15	2 2 25.49	2.1933	14 46 12.3	8.660	15	3 49 9.80	2.2437	19 54 1.9	3.963
16	2 4 37.14	2.1948	14 54 49.4	8.576	16	3 51 24.43	2.2439	19 57 56.4	3.854
17	2 6 48.88	2.1963	15 3 21.4	8.492	17	3 53 39.07	2.2441	20 1 44.4	3.746
18	2 9 0.70	2.1978	15 11 48.4	8.407	18	3 55 53.72	2.2441	20 5 25.9	3.636
19	2 11 12.61	2.1992	15 20 10.2	8.321	19	3 58 8.37	2.2443	20 9 0.8	3.527
20	2 13 24.61	2.2007	15 28 26.9	8.235	20	4 0 23.02	2.2443	20 12 29.2	3.417
21	2 15 36.70	2.2022	15 36 38.4	8.148	21	4 2 37.67	2.2443	20 15 51.1	3.306
22	2 17 48.87	2.2037	15 44 44.6	8.069	22	4 4 52.32	2.2441	20 19 6.4	3.200
23	2 20 1.13	2.2061	15 52 45.5	7.971	23	4 7 6.96	2.2439	20 22 15.1	3.091
24	2 22 13.48	2.2066	N. 16° 0' 41.2"	7.861	24	4 9 21.59	2.2437	N. 20° 25' 17.3"	2.981

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 25.					FRIDAY 27.				
0	4 9 21.59	2.2437	N.20° 25' 17.3	2.361	0	5 55 51.27	2.1747	N.20° 42' 30.9	2.167
1	4 11 36.20	2.2434	20 28 12.8	2.970	1	5 58 1.67	2.1731	20 40 16.6	2.268
2	4 13 50.80	2.2431	20 31 1.7	2.780	2	6 0 11.92	2.1695	20 37 56.3	2.266
3	4 16 5.38	2.2428	20 33 44.0	2.649	3	6 2 22.01	2.1669	20 35 30.0	2.466
4	4 18 19.94	2.2424	20 36 19.6	2.589	4	6 4 31.95	2.1643	20 32 57.7	2.867
5	4 20 34.47	2.2420	20 38 48.7	2.429	5	6 6 41.73	2.1616	20 30 19.5	2.866
6	4 22 48.98	2.2414	20 41 11.1	2.319	6	6 8 51.34	2.1589	20 27 35.4	2.784
7	4 25 3.45	2.2409	20 43 26.9	2.208	7	6 11 0.79	2.1562	20 24 45.4	2.983
8	4 27 17.89	2.2403	20 45 36.1	2.098	8	6 13 10.08	2.1534	20 21 49.5	2.979
9	4 29 32.29	2.2397	20 47 38.7	1.988	9	6 15 19.20	2.1506	20 18 47.8	2.076
10	4 31 46.65	2.2390	20 49 34.6	1.878	10	6 17 28.15	2.1478	20 15 40.4	2.172
11	4 34 0.96	2.2383	20 51 24.0	1.767	11	6 19 36.93	2.1449	20 12 27.2	2.268
12	4 36 15.23	2.2377	20 53 6.7	1.657	12	6 21 45.54	2.1420	20 9 8.2	2.362
13	4 38 29.44	2.2364	20 54 42.8	1.547	13	6 23 53.98	2.1391	20 5 43.6	2.457
14	4 40 43.60	2.2355	20 56 12.3	1.437	14	6 26 2.23	2.1361	20 2 13.3	2.551
15	4 42 57.70	2.2346	20 57 35.3	1.327	15	6 28 10.31	2.1332	19 58 37.4	2.646
16	4 45 11.75	2.2336	20 58 51.6	1.217	16	6 30 18.21	2.1302	19 54 55.8	2.738
17	4 47 25.73	2.2324	21 0 1.3	1.106	17	6 32 25.93	2.1272	19 51 8.7	2.831
18	4 49 39.64	2.2313	21 1 4.3	0.997	18	6 34 33.47	2.1243	19 47 16.1	2.923
19	4 51 53.49	2.2302	21 2 0.8	0.888	19	6 36 40.83	2.1212	19 43 17.9	4.016
20	4 54 7.26	2.2290	21 2 50.7	0.777	20	6 38 48.01	2.1182	19 39 14.3	4.106
21	4 56 20.96	2.2277	21 3 34.0	0.666	21	6 40 55.01	2.1151	19 35 5.2	4.196
22	4 58 34.58	2.2268	21 4 10.7	0.557	22	6 43 1.82	2.1119	19 30 50.8	4.286
23	5 0 48.12	2.2249	N.21 4 40.9	0.448	23	6 45 8.44	2.1088	N.19 26 31.0	4.376
THURSDAY 26.					SATURDAY 28.				
0	5 3 1.57	2.2234	N.21 5 4.5	0.340	0	6 47 14.88	2.1056	N.19 22 5.8	4.463
1	5 5 14.93	2.2218	21 5 21.6	0.231	1	6 49 21.12	2.1025	19 17 35.4	4.551
2	5 7 28.19	2.2208	21 5 32.2	0.122	2	6 51 27.18	2.0993	19 12 59.7	4.638
3	5 9 41.36	2.2198	21 5 36.3	0.014	3	6 53 33.05	2.0962	19 8 18.8	4.726
4	5 11 54.44	2.2171	21 5 33.9	0.094	4	6 55 38.73	2.0930	19 3 32.7	4.811
5	5 14 7.42	2.2154	21 5 25.0	0.202	5	6 57 44.22	2.0899	18 58 41.4	4.897
6	5 16 20.29	2.2137	21 5 9.7	0.309	6	6 59 49.52	2.0867	18 53 45.1	4.981
7	5 18 33.06	2.2119	21 4 48.0	0.416	7	7 1 54.63	2.0836	18 48 43.7	5.065
8	5 20 45.72	2.2101	21 4 19.8	0.523	8	7 3 59.55	2.0804	18 43 37.3	5.149
9	5 22 58.27	2.2082	21 3 45.2	0.630	9	7 6 4.28	2.0773	18 38 25.8	5.233
10	5 25 10.70	2.2064	21 3 4.2	0.736	10	7 8 8.82	2.0740	18 33 9.4	5.316
11	5 27 23.02	2.2043	21 2 16.9	0.842	11	7 10 13.17	2.0708	18 27 48.0	5.397
12	5 29 35.22	2.2023	21 1 23.2	0.947	12	7 12 17.32	2.0676	18 22 21.8	5.477
13	5 31 47.29	2.2001	21 0 23.2	1.053	13	7 14 21.27	2.0643	18 16 50.7	5.556
14	5 33 59.23	2.1980	20 59 16.8	1.158	14	7 16 25.02	2.0609	18 11 14.8	5.636
15	5 36 11.05	2.1960	20 58 4.1	1.263	15	7 18 28.57	2.0577	18 5 34.1	5.716
16	5 38 22.74	2.1937	20 56 45.2	1.367	16	7 20 31.94	2.0545	17 59 48.6	5.796
17	5 40 34.29	2.1914	20 55 20.0	1.473	17	7 22 35.12	2.0514	17 53 58.4	5.876
18	5 42 45.71	2.1891	20 53 48.6	1.576	18	7 24 38.11	2.0482	17 48 3.6	5.952
19	5 44 56.99	2.1869	20 52 11.0	1.678	19	7 26 40.91	2.0451	17 42 4.1	6.029
20	5 47 8.14	2.1846	20 50 27.3	1.780	20	7 28 43.52	2.0419	17 36 0.1	6.106
21	5 49 19.14	2.1822	20 48 37.4	1.882	21	7 30 45.94	2.0387	17 29 51.5	6.182
22	5 51 30.00	2.1797	20 46 41.3	1.985	22	7 32 48.18	2.0356	17 23 38.3	6.266
23	5 53 40.71	2.1773	20 44 39.1	2.087	23	7 34 50.23	2.0324	17 17 20.7	6.331
24	5 55 51.27	2.1747	N.20 42 30.9	2.187	24	7 36 52.09	2.0292	N.17 10 58.6	6.404

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 29.					MONDAY 30.				
0	h m s	s	N.17° 10' 58.6"	6.404	0	h m s	s	N.14° 17' 33.9"	7.987
1	7 36 52.09	2.0282	17 4 32.1	6.477	1	8 24 41.73	1.9584	14 9 32.9	8.046
2	7 38 53.74	2.0280	16 58 1.3	6.549	2	8 26 39.16	1.9587	14 1 28.4	8.108
3	7 40 55.21	2.0259	16 51 26.1	6.623	3	8 28 36.42	1.9592	13 53 20.5	8.160
4	7 42 56.49	2.0197	16 44 46.7	6.692	4	8 30 33.53	1.9595	13 45 9.2	8.216
5	7 44 57.58	2.0167	16 38 3.0	6.763	5	8 32 30.49	1.9481	13 36 54.5	8.273
6	7 46 58.49	2.0136	16 31 15.1	6.833	6	8 34 27.30	1.9455	13 28 36.4	8.328
7	7 48 59.21	2.0106	16 24 23.0	6.903	7	8 36 23.95	1.9420	13 20 15.1	8.383
8	7 50 59.75	2.0074	16 17 26.8	6.973	8	8 38 20.45	1.9405	13 11 50.5	8.436
9	7 53 0.10	2.0044	16 10 26.4	7.040	9	8 40 16.81	1.9381	13 3 22.7	8.490
10	7 55 0.27	2.0013	16 3 22.0	7.107	10	8 42 13.02	1.9367	12 54 51.7	8.543
11	7 57 0.96	1.9983	15 56 13.5	7.174	11	8 44 9.09	1.9334	12 46 17.5	8.596
12	7 59 0.07	1.9953	15 49 1.2	7.240	12	8 46 5.02	1.9310	12 37 40.2	8.647
13	8 0 59.70	1.9923	15 41 44.8	7.306	13	8 48 0.81	1.9287	12 28 59.8	8.698
14	8 2 59.15	1.9893	15 34 24.5	7.371	14	8 49 56.46	1.9264	12 20 16.4	8.748
15	8 4 58.42	1.9864	15 27 0.3	7.436	15	8 51 51.98	1.9242	12 11 29.9	8.799
16	8 6 57.52	1.9835	15 19 32.2	7.499	16	8 53 47.36	1.9220	12 2 40.5	8.848
17	8 8 56.44	1.9806	15 12 0.3	7.563	17	8 55 42.62	1.9199	11 53 48.1	8.896
18	8 10 55.19	1.9777	15 4 24.7	7.625	18	8 57 37.75	1.9177	11 44 52.8	8.945
19	8 12 53.77	1.9748	14 56 45.3	7.687	19	8 59 32.75	1.9157	11 35 54.7	8.993
20	8 14 52.18	1.9731	14 49 2.3	7.747	20	9 1 27.63	1.9137	11 26 53.7	9.039
21	8 16 50.42	1.9699	14 41 15.6	7.808	21	9 3 22.40	1.9118	11 17 49.9	9.086
22	8 18 48.49	1.9665	14 33 25.3	7.868	22	9 5 17.05	1.9099	11 8 43.4	9.133
23	8 20 46.40	1.9636	14 25 31.4	7.928	23	9 7 11.58	1.9080	10 59 34.1	9.178
24	8 22 44.15	1.9611	N.14 17 33.9	7.987	24	9 9 6.01	1.9061	N.10 50 22.2	9.223
	8 24 41.73	1.9584				9 11 0.31	1.9042		

PHASES OF THE MOON.

☾ Last Quarter,	d	h	m
● New Moon,	3	3	34.0
☽ First Quarter,	10	19	59.1
○ Full Moon,	17	15	5.2
	24	21	1.3

☾ Apogee,	d	h
☾ Perigee,	2	13.0
☾ Apogee,	14	12.6
	30	9.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	α Arietis W.	70° 32' 21"	3063	72° 0' 51"	3088	73° 29' 15"	3093	74° 57' 33"	3097
	Aldebaran W.	37 13 58	3078	38 42 40	3077	40 11 18	3079	41 39 53	3083
	Regulus E.	42 54 16	3086	41 25 49	3084	39 57 32	3103	38 29 26	3111
	Venus E.	74 43 32	3209	73 17 33	3216	71 51 43	3223	70 26 1	3230
	Saturn E.	87 11 28	3108	85 43 22	3109	84 15 23	3114	82 47 30	3119
	SUN E.	113 18 42	3419	111 56 47	3426	110 34 59	3431	109 13 17	3436
2	α Arietis W.	82 17 58	3113	83 45 53	3113	85 13 47	3114	86 41 39	3116
	Aldebaran W.	49 1 58	3093	50 30 16	3093	51 58 34	3095	53 26 50	3094
	Regulus E.	31 11 29	3156	29 44 27	3164	28 17 35	3177	26 50 58	3186
	Venus E.	63 19 19	3256	61 54 16	3269	60 29 17	3263	59 4 22	3265
	Saturn E.	75 29 26	3138	74 2 2	3139	72 34 40	3141	71 7 20	3143
	SUN E.	102 26 6	3454	101 4 50	3456	99 43 37	3497	98 22 25	3499
3	α Arietis W.	94 0 52	3113	95 28 46	3111	96 56 42	3110	98 24 40	3108
	Aldebaran W.	60 48 21	3089	62 16 44	3087	63 45 10	3083	65 13 40	3080
	Pollux W.	21 6 52	3726	22 23 13	3647	23 40 57	3679	24 59 54	3623
	Venus E.	52 0 23	3273	50 35 39	3273	49 10 55	3271	47 46 10	3270
	Saturn E.	63 50 54	3143	62 23 36	3149	60 56 17	3139	59 28 55	3138
	SUN E.	91 36 34	3455	90 15 20	3453	88 54 3	3461	87 32 44	3448
4	α Arietis W.	105 45 32	3087	107 13 58	3081	108 42 31	3076	110 11 10	3069
	Aldebaran W.	72 37 24	3065	74 6 29	3060	75 35 40	3044	77 4 58	3036
	Pollux W.	31 47 59	3326	33 11 38	3300	34 35 49	3274	36 0 31	3260
	Venus E.	40 41 56	3269	39 16 56	3254	37 51 51	3261	36 26 42	3247
	Saturn E.	52 11 20	3131	50 43 36	3117	49 15 47	3113	47 47 52	3107
	SUN E.	80 45 2	3423	79 23 11	3416	78 1 13	3410	76 39 8	3401
5	Aldebaran W.	84 33 56	2995	86 4 15	2985	87 34 46	2974	89 5 31	2968
	Pollux W.	43 10 32	3148	44 37 43	3130	46 5 16	3113	47 33 10	3096
	Venus E.	29 19 41	3224	27 54 0	3219	26 28 13	3214	25 2 21	3210
	Saturn E.	40 26 42	3079	38 58 7	3073	37 29 25	3068	36 0 36	3063
	SUN E.	69 46 19	3358	68 23 14	3348	66 59 56	3337	65 36 27	3334
6	Aldebaran W.	96 42 34	2909	98 14 42	2896	99 47 6	2883	101 19 46	2870
	Pollux W.	54 57 57	3011	56 27 56	2996	57 58 15	2978	59 28 55	2962
	Regulus W.	18 2 43	3114	19 30 36	3071	20 59 21	3034	22 28 52	3001
	Saturn E.	28 35 3	3043	27 5 44	3043	25 36 25	3045	24 7 8	3049
	SUN E.	58 35 35	3263	57 10 40	3249	55 45 29	3236	54 20 3	3223
7	Pollux W.	67 7 23	2880	68 40 7	2864	70 13 12	2847	71 46 39	2832
	Regulus W.	30 5 39	2873	31 38 34	2851	33 11 56	2830	34 45 45	2816
	SUN E.	47 8 34	3148	45 41 22	3133	44 13 52	3117	42 46 3	3101
8	Pollux W.	79 39 2	2762	81 14 33	2737	82 50 24	2730	84 26 37	2704
	Regulus W.	42 41 10	2716	44 17 28	2699	45 54 9	2681	47 31 14	2665
	SUN E.	35 22 6	3021	33 52 19	3004	32 22 11	2989	30 51 44	2973
12	SUN W.	15 11 23	2601	16 50 17	2583	18 29 22	2565	20 8 38	2578
	Fomalhaut E.	87 33 33	2753	85 58 3	2750	84 22 30	2747	82 46 53	2747
	α Pegasi E.	105 34 22	2430	103 51 30	2419	102 8 23	2411	100 25 4	2403
13	SUN W.	28 27 5	2551	30 7 7	2548	31 47 14	2545	33 27 25	2541
	Fomalhaut E.	74 48 49	2756	73 13 24	2763	71 38 8	2773	70 3 3	2783
	α Pegasi E.	91 46 7	2376	90 1 58	2373	88 17 44	2371	86 33 27	2368

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	α Arietis W.	76° 25' 46"	3101	77° 53' 55"	3104	79° 22' 0"	3107	80° 50' 1"	3110
	Aldebaran W.	43 8 24	3086	44 36 51	3087	46 5 16	3090	47 33 38	3091
	Regulus E.	37 1 30	3119	35 33 44	3120	34 6 9	3137	32 38 44	3145
	Venus E.	69 0 27	3236	67 35 1	3243	66 9 41	3247	64 44 27	3262
	Saturn E.	81 19 43	3124	79 52 2	3128	78 24 26	3131	76 56 54	3134
	Sun E.	107 51 41	3440	106 30 10	3446	105 8 45	3448	103 47 23	3453
2	α Arietis W.	88 9 29	3116	89 37 19	3116	91 5 9	3118	92 33 0	3114
	Aldebaran W.	54 55 7	3084	56 23 24	3084	57 51 41	3093	59 20 0	3091
	Regulus E.	25 24 34	3203	23 58 27	3218	22 32 39	3236	21 7 12	3266
	Venus E.	57 39 30	3268	56 14 41	3270	54 49 54	3270	53 25 8	3271
	Saturn E.	69 40 2	3143	68 12 45	3143	66 45 28	3143	65 18 11	3143
	Sun E.	97 1 15	3460	95 40 6	3468	94 18 55	3468	92 57 45	3468
3	α Arietis W.	99 52 42	3103	101 20 48	3100	102 48 58	3096	104 17 12	3091
	Aldebaran W.	66 42 14	3076	68 10 53	3071	69 39 38	3067	71 8 28	3062
	Pollux W.	26 19 53	3473	27 40 47	3431	29 2 29	3392	30 24 55	3366
	Venus E.	46 21 24	3260	44 56 36	3267	43 31 46	3264	42 6 52	3262
	Saturn E.	58 1 31	3135	56 34 4	3133	55 6 33	3129	53 38 59	3125
	Sun E.	86 11 22	3444	84 49 55	3439	83 28 23	3434	82 6 45	3430
4	α Arietis W.	111 39 57	3064	113 8 51	3066	114 37 54	3049	116 7 6	3041
	Aldebaran W.	78 34 26	3029	80 4 3	3021	81 33 50	3012	83 3 48	3004
	Pollux W.	37 25 41	3229	38 51 16	3207	40 17 17	3187	41 43 42	3166
	Venus E.	35 1 29	3243	33 36 11	3238	32 10 47	3233	30 45 17	3228
	Saturn E.	46 19 51	3102	44 51 44	3097	43 23 31	3091	41 55 10	3086
	Sun E.	75 16 53	3394	73 54 30	3385	72 31 56	3377	71 9 13	3367
5	Aldebaran W.	90 36 28	2964	92 7 38	2943	93 39 2	2931	95 10 41	2920
	Pollux W.	49 1 26	3078	50 30 2	3060	51 59 0	3044	53 28 18	3027
	Venus E.	23 36 24	3207	22 10 23	3206	20 44 20	3204	19 18 16	3202
	Saturn E.	34 31 41	3067	33 2 39	3063	31 33 32	3049	30 4 20	3045
	Sun E.	64 12 44	3313	62 48 48	3301	61 24 38	3289	60 0 14	3276
6	Aldebaran W.	102 52 43	2856	104 25 56	2845	105 59 26	2831	107 33 13	2816
	Pollux W.	60 59 55	2946	62 31 17	2930	64 2 58	2913	65 35 0	2897
	Regulus W.	23 59 4	2970	25 29 54	2944	27 1 17	2916	28 33 13	2894
	Saturn E.	22 37 56	3067	21 8 54	3070	19 40 8	3057	18 11 43	3119
	Sun E.	52 54 20	3207	51 28 19	3193	50 2 2	3178	48 35 27	3163
7	Pollux W.	73 20 25	2815	74 54 33	2800	76 29 1	2784	78 3 50	2766
	Regulus W.	36 20 0	2791	37 54 40	2771	39 29 46	2753	41 5 16	2736
	Sun E.	41 17 55	3065	39 49 27	3069	38 20 40	3063	36 51 33	3037
8	Pollux W.	86 3 10	2689	87 40 4	2675	89 17 18	2660	90 54 52	2645
	Regulus W.	49 8 41	2647	50 46 32	2632	52 24 44	2616	54 3 19	2598
	Sun E.	29 20 57	2956	27 49 49	2941	26 18 22	2924	24 46 34	2910
12	Sun W.	21 48 3	2573	23 27 37	2566	25 7 19	2560	26 47 9	2556
	Fomalhaut E.	81 11 15	2745	79 35 35	2746	77 59 56	2750	76 24 22	2750
	α Pegasi E.	98 41 34	2396	96 57 54	2391	95 14 6	2386	93 30 10	2380
13	Sun W.	35 7 41	2530	36 48 0	2537	38 28 22	2535	40 8 46	2534
	Fomalhaut E.	68 28 11	2796	66 53 36	2808	65 19 18	2823	63 45 20	2843
	α Pegasi E.	84 49 7	2367	83 4 45	2366	81 20 22	2367	79 36 0	2366

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
14	SUN W.	41° 49' 12"	2634	43° 29' 38"	2634	45° 10' 4"	2633	46° 50' 31"	2636
	Fomalhaut E.	62 11 47	2692	60 38 39	2696	59 6 2	2911	57 33 57	2940
	α Pegasi E.	77 51 37	2699	76 7 18	2671	74 23 2	2674	72 38 50	2677
	α Arietis E.	121 9 39	2676	119 23 3	2674	117 36 25	2673	115 49 44	2670
15	SUN W.	55 12 19	2643	56 52 33	2648	58 32 43	2648	60 12 49	2661
	Fomalhaut E.	50 4 6	3143	48 36 47	3196	47 10 33	3266	45 45 32	3326
	α Pegasi E.	63 59 28	2496	62 16 4	2416	60 32 51	2426	58 49 52	2426
	α Arietis E.	106 56 12	2373	105 9 33	2374	103 22 56	2377	101 36 22	2379
16	SUN W.	68 32 6	2671	70 11 41	2676	71 51 9	2661	73 30 30	2666
	Fomalhaut E.	39 3 5	3611	37 48 14	3649	36 35 44	4107	35 25 49	4264
	α Pegasi E.	50 19 10	2697	48 38 6	2626	46 57 28	2645	45 17 18	2666
	α Arietis E.	92 44 38	2396	90 58 33	2300	89 12 34	2365	87 26 42	2310
17	SUN W.	81 45 28	2614	83 24 4	2619	85 2 33	2636	86 40 53	2632
	α Pegasi E.	37 5 23	2726	35 29 17	2770	33 54 10	2821	32 20 10	2890
	α Arietis E.	78 39 14	2337	76 54 9	2344	75 9 13	2350	73 24 27	2357
	Aldebaran E.	111 49 32	2399	110 3 46	2314	108 18 7	2320	106 32 36	2326
18	SUN W.	94 50 25	2664	96 27 53	2669	98 5 14	2677	99 42 25	2686
	α Aquilæ W.	37 39 28	3645	38 57 14	3666	40 16 38	3476	41 37 29	3406
	α Arietis E.	64 43 1	2396	62 59 16	2400	61 15 41	2408	59 32 18	2417
	Aldebaran E.	97 47 5	2365	96 2 25	2361	94 17 54	2366	92 33 31	2373
19	SUN W.	107 45 56	2719	109 22 11	2727	110 58 15	2733	112 34 11	2741
	α Aquilæ W.	48 38 29	3160	50 5 15	3128	51 32 39	3110	53 0 36	3066
	α Arietis E.	50 58 30	2463	49 16 25	2473	47 34 34	2484	45 52 58	2496
	Aldebaran E.	83 53 53	2406	82 10 26	2412	80 27 8	2419	78 44 0	2426
20	SUN W.	120 31 25	2776	122 6 22	2784	123 41 11	2792	125 15 49	2800
	α Aquilæ W.	60 26 51	3001	61 57 3	2990	63 27 28	2983	64 58 3	2974
	Fomalhaut W.	36 27 34	4166	37 36 43	4623	38 47 51	4624	40 0 46	4629
	α Arietis E.	37 29 21	2665	35 49 38	2663	34 10 19	2601	32 31 25	2623
	Aldebaran E.	70 10 46	2461	68 28 38	2466	66 46 40	2476	65 4 52	2463
	Pollux E.	112 11 19	2636	110 30 56	2640	108 50 39	2645	107 10 28	2661
21	α Aquilæ W.	72 32 44	2697	74 3 51	2668	75 34 56	2666	77 6 2	2666
	Fomalhaut W.	46 26 27	3469	47 46 52	3466	49 8 5	3416	50 30 5	3379
	α Pegasi W.	25 15 51	3373	26 38 39	3363	28 3 10	3209	29 29 8	3149
	Aldebaran E.	56 38 34	2623	54 57 52	2630	53 17 21	2630	51 37 2	2646
	Pollux E.	98 51 46	2666	97 12 28	2691	95 33 21	2697	93 54 22	2694
22	α Aquilæ W.	84 40 38	2660	86 11 16	2667	87 41 45	2666	89 12 4	2661
	Fomalhaut W.	57 28 40	3269	58 53 40	3243	60 18 59	3236	61 44 35	3217
	α Pegasi W.	36 53 45	2696	38 24 40	2647	39 55 59	2620	41 27 41	2616
	Aldebaran E.	43 18 30	2666	41 39 26	2604	40 0 36	2614	38 22 0	2634
	Pollux E.	85 41 59	2644	84 4 4	2662	82 26 20	2660	80 48 47	2670
	Regulus E.	122 31 21	2666	120 52 17	2601	119 13 24	2606	107 34 40	2613
23	α Aquilæ W.	96 41 5	3060	98 10 14	3064	99 39 8	3077	101 7 46	3091
	Fomalhaut W.	68 55 19	3163	70 21 48	3181	71 48 20	3179	73 14 54	3176
	α Pegasi W.	49 9 37	2678	50 42 24	2676	52 15 14	2674	53 48 6	2674
	Aldebaran E.	30 12 52	2667	28 35 55	2708	26 59 18	2718	25 23 2	2726
	Pollux E.	72 44 11	2718	71 7 55	2726	69 31 52	2739	67 56 4	2766

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
14	SUN W.	48° 30' 56"	2635	50° 11' 20"	2635	51° 51' 41"	2635	53° 32' 1"	2640
	Fomalhaut E.	56 2 29	2672	54 31 41	3008	53 1 38	3048	51 32 25	3092
	a Pegasi E.	70 54 42	2882	69 10 41	2386	67 26 49	2393	65 43 4	2360
	a Arietis E.	114 3 1	2370	112 16 18	2870	110 29 35	2371	108 42 53	2372
15	SUN W.	61 52 51	2666	63 32 48	2666	65 12 39	2663	66 52 25	2666
	Fomalhaut E.	44 21 50	3401	42 59 35	3486	41 38 57	3482	40 20 3	3490
	a Pegasi E.	57 7 9	2445	55 24 39	2460	53 42 29	2474	52 0 39	2489
	a Arietis E.	99 49 52	2363	98 3 26	2360	96 17 5	2369	94 30 49	2392
16	SUN W.	75 9 44	2691	76 48 51	2696	78 27 51	2692	80 6 43	2697
	Fomalhaut E.	34 18 42	4490	33 14 41	4736	32 14 3	4999	31 17 7	5318
	a Pegasi E.	43 37 39	2696	41 58 34	2621	40 20 7	2692	38 42 22	2684
	a Arietis E.	85 40 57	2815	83 55 19	2821	82 9 50	2826	80 24 28	2831
17	SUN W.	88 19 5	2638	89 57 8	2644	91 35 3	2652	93 12 48	2657
	a Pegasi E.	30 47 26	2648	29 16 8	2628	27 46 30	3121	26 18 46	3230
	a Arietis E.	71 39 50	2363	69 55 22	2371	68 11 5	2378	66 26 58	2384
	Aldebaran E.	104 47 13	2331	103 1 58	2337	101 16 52	2342	99 31 54	2348
18	SUN W.	101 19 24	2691	102 56 16	2696	104 32 59	2705	106 9 32	2712
	a Aquilæ W.	42 59 37	3247	44 22 54	3264	45 47 13	3247	47 12 27	3296
	a Arietis E.	57 49 7	2425	56 6 8	2434	54 23 22	2443	52 40 49	2453
	Aldebaran E.	90 49 17	2379	89 5 12	2365	87 21 16	2392	85 37 30	2398
19	SUN W.	114 9 57	2746	115 45 33	2755	117 21 0	2763	118 56 17	2769
	a Aquilæ W.	54 29 4	3068	55 57 59	3044	57 27 17	3028	58 56 55	3014
	a Arietis E.	44 11 39	2606	42 30 37	2620	40 49 52	2634	39 9 26	2649
	Aldebaran E.	77 1 2	2482	75 18 13	2439	73 35 34	2446	71 53 5	2453
20	SUN W.	126 50 17	2898	128 24 35	2915	129 58 43	2923	131 32 41	2931
	a Aquilæ W.	66 28 48	2969	67 59 40	2964	69 30 38	2961	71 1 40	2969
	Fomalhaut W.	41 15 18	3746	42 31 16	3873	43 48 33	3869	45 6 58	3852
	a Arietis E.	30 53 0	2645	29 15 6	2672	27 37 48	2701	26 1 10	2737
	Aldebaran E.	63 23 15	2490	61 41 48	2499	60 0 33	2506	58 19 28	2514
	Pollux E.	105 30 26	2656	103 50 33	2654	102 10 49	2670	100 31 13	2677
21	a Aquilæ W.	78 37 5	2961	80 8 7	2966	81 39 2	2969	83 9 53	2974
	Fomalhaut W.	51 52 45	3349	53 16 0	3322	54 39 46	3297	56 4 1	3276
	a Pegasi W.	30 56 18	3098	32 24 30	3066	33 53 33	3020	35 23 21	2991
	Aldebaran E.	49 56 55	2566	48 17 0	2656	46 37 17	2674	44 57 47	2684
	Pollux E.	92 15 33	2612	90 36 54	2619	88 58 25	2627	87 20 7	2635
22	a Aquilæ W.	90 42 15	3099	92 12 17	3019	93 42 6	3030	95 11 42	3040
	Fomalhaut W.	63 10 24	3307	64 36 25	3198	66 2 36	3193	67 28 54	3187
	a Pegasi W.	42 59 40	2904	44 31 54	2904	46 4 20	2897	47 36 56	2893
	Aldebaran E.	36 43 38	2636	35 5 32	2643	33 27 42	2660	31 50 8	2673
	Pollux E.	79 11 27	2678	77 34 18	2699	75 57 23	2696	74 20 40	2708
	Regulus E.	115 56 6	2623	114 17 42	2631	112 39 29	2639	111 1 27	2646
23	a Aquilæ W.	102 36 7	3166	104 4 11	3120	105 31 56	3137	106 59 21	3155
	Fomalhaut W.	74 41 29	3179	76 8 4	3181	77 34 36	3185	79 1 3	3188
	a Pegasi W.	55 20 58	2874	56 53 50	2876	58 26 39	2877	59 59 27	2881
	Aldebaran E.	23 47 10	2780	22 11 45	2779	20 36 50	2806	19 2 29	2836
	Pollux E.	66 20 31	2761	64 45 12	2775	63 10 11	2785	61 35 23	2796

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
23	Regulus E.	109° 23' 35"	2656	107° 45' 54"	2663	106° 8' 24"	2671	104° 31' 5"	2680
24	Fomalhaut W.	80 27 27	3193	81 53 44	3199	83 19 54	3206	84 45 57	3213
	α Pegasi W.	61 32 10	2684	63 4 49	2689	64 37 22	2694	66 9 49	2699
	α Arietis W.	18 13 24	3137	19 40 49	3092	21 9 20	3043	22 38 40	3011
	Pollux E.	60 0 52	3611	58 26 38	2624	56 52 41	2636	55 19 0	2640
	Regulus E.	96 27 28	3724	94 51 20	3734	93 15 25	3743	91 39 41	3763
25	Fomalhaut W.	91 53 53	3366	93 18 54	3367	94 43 44	3369	96 8 16	3394
	α Pegasi W.	73 50 13	2931	75 21 52	2939	76 53 22	2946	78 24 42	2965
	α Arietis W.	30 12 23	2941	31 43 50	2937	33 15 22	2936	34 46 57	2934
	Pollux E.	47 35 22	2931	46 3 42	2948	44 32 24	2966	43 1 29	2966
	Regulus E.	83 44 13	2901	82 9 46	2911	80 35 32	2920	79 1 30	2931
26	Fomalhaut W.	103 7 12	3366	104 30 7	3363	105 52 43	3400	107 14 59	3416
	α Pegasi W.	85 58 43	2998	87 28 58	3007	88 59 2	3017	90 28 54	3026
	α Arietis W.	42 24 35	2946	43 55 55	2960	45 27 10	2966	46 58 18	2963
	Pollux E.	35 33 44	3109	34 5 45	3139	32 38 23	3173	31 11 41	3210
	Regulus E.	71 14 37	2980	69 41 53	2991	68 9 23	2990	66 37 4	2911
	Saturn E.	118 12 52	2919	116 40 57	2927	115 9 13	2935	113 37 39	2945
	Venus E.	120 56 35	2909	119 30 36	2919	118 4 49	2928	116 39 13	2939
27	α Pegasi W.	97 55 14	3076	99 23 54	3086	100 52 21	3096	102 20 36	3106
	α Arietis W.	54 32 8	2993	56 2 30	2999	57 32 44	3006	59 2 51	3013
	Aldebaran W.	21 15 8	3029	22 44 45	3036	24 14 26	3036	25 44 8	3036
	Regulus E.	58 58 44	2961	57 27 42	2969	55 56 51	2981	54 26 14	2989
	Saturn E.	106 2 38	2988	104 32 10	2997	103 1 53	3006	101 31 46	3013
	Venus E.	109 34 15	2996	108 9 50	2999	106 45 37	2998	105 21 35	2916
	Spica E.	112 45 47	2991	111 14 8	2939	109 42 39	2948	108 11 21	2966
28	α Arietis W.	66 31 19	3044	68 0 37	3061	69 29 47	3066	70 58 50	3063
	Aldebaran W.	33 12 9	3039	34 41 34	3043	36 10 53	3047	37 40 8	3052
	Regulus E.	46 56 3	3036	45 26 37	3047	43 57 22	3056	42 28 19	3065
	Saturn E.	94 3 40	3092	92 34 31	3099	91 5 31	3056	89 36 39	3073
	Venus E.	98 24 4	3392	97 1 4	3370	95 38 13	3378	94 15 31	3396
	Spica E.	100 37 28	2996	99 7 10	3003	97 37 1	3009	96 7 0	3017
	Jupiter E.	122 39 1	3076	121 10 22	3084	119 41 53	3091	118 13 33	3097
29	α Arietis W.	78 22 19	3069	79 50 42	3084	81 18 59	3096	82 47 11	3101
	Aldebaran W.	45 5 2	3073	46 33 46	3076	48 2 26	3079	49 31 1	3082
	Regulus E.	35 5 59	3114	33 38 7	3126	32 10 29	3136	30 43 3	3146
	Saturn E.	82 14 20	3102	80 46 13	3107	79 18 12	3119	77 50 17	3117
	Venus E.	87 24 10	3430	86 2 16	3436	84 40 29	3432	83 18 49	3436
	Spica E.	88 38 56	3047	87 9 41	3061	85 40 31	3056	84 11 27	3060
	Jupiter E.	110 53 42	3126	109 26 4	3131	107 58 32	3136	106 31 6	3140
	SUN E.	133 31 15	3431	132 9 33	3436	130 47 57	3441	129 26 27	3446
30	α Arietis W.	90 7 9	3117	91 34 58	3119	93 2 45	3120	94 30 30	3129
	Aldebaran W.	56 53 6	3094	58 21 23	3096	59 49 38	3096	61 17 52	3096
	Pollux W.	17 53 8	4034	19 4 14	3992	20 17 32	3796	21 32 39	3799
	Saturn E.	70 31 56	3133	69 4 27	3136	67 37 1	3136	66 9 38	3140
	Venus E.	76 31 45	3456	75 10 32	3460	73 49 23	3463	72 28 17	3464
	Spica E.	76 47 16	3076	75 18 37	3077	73 49 59	3079	72 21 24	3080
	Jupiter E.	99 15 4	3166	97 48 2	3166	96 21 2	3166	94 54 3	3160
	SUN E.	122 40 6	3463	121 19 0	3463	119 57 57	3467	118 36 56	3468

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
23	Regulus E.	102° 53' 58"	2690	101° 17' 3"	2690	99° 40' 20"	2706	98° 3' 48"	2716
24	Fomalhaut W.	86 11 51	3220	87 37 37	3237	89 3 14	3236	90 28 40	3247
	a Pegasi W.	67 42 9	2906	69 14 22	2910	70 46 28	2917	72 18 25	2924
	a Arietis W.	24 8 39	2999	25 39 6	2999	27 9 57	2967	28 41 4	2947
	Pollux E.	53 45 37	2866	52 12 34	2880	50 39 49	2866	49 7 25	2912
	Regulus E.	90 4 10	2762	88 28 52	2772	86 53 47	2780	85 18 53	2791
25	Fomalhaut W.	97 32 35	3306	98 56 39	3320	100 20 27	3335	101 43 58	3350
	a Pegasi W.	79 55 51	2963	81 26 50	2971	82 57 39	2980	84 28 17	2989
	a Arietis W.	36 18 33	2935	37 50 8	2935	39 21 41	2939	40 53 10	2942
	Pollux E.	41 30 59	3008	40 0 56	3031	38 31 22	3055	37 2 17	3081
	Regulus E.	77 27 42	2840	75 54 6	2851	74 20 44	2860	72 47 34	2870
26	Fomalhaut W.	108 36 54	3438	109 58 28	3458	111 19 39	3480	112 40 26	3501
	a Pegasi W.	91 58 34	3036	93 28 2	3045	94 57 18	3055	96 26 22	3065
	a Arietis W.	48 29 19	2967	50 0 13	2973	51 30 59	2979	53 1 38	2986
	Pollux E.	29 45 44	2922	28 20 36	2930	26 56 23	2952	25 33 12	2412
	Regulus E.	65 4 59	2921	63 33 7	2931	62 1 27	2940	60 29 59	2950
	Saturn E.	112 6 17	2964	110 35 6	2962	109 4 6	2970	107 33 16	2980
	Venus E.	115 13 50	3249	113 48 39	3260	112 23 39	3269	110 58 51	3279
27	a Pegasi W.	103 48 39	3116	105 16 30	3126	106 44 8	3137	108 11 33	3148
	a Arietis W.	60 32 49	3018	62 2 39	3026	63 32 20	3032	65 1 53	3038
	Aldebaran W.	27 13 50	3026	28 43 30	3029	30 13 7	3032	31 42 40	3035
	Regulus E.	52 55 48	2999	51 25 34	3009	49 55 32	3018	48 25 41	3028
	Saturn E.	100 1 49	3021	98 32 2	3029	97 2 25	3037	95 32 58	3044
	Venus E.	103 57 44	3226	102 34 3	3236	101 10 33	3245	99 47 13	3254
	Spica E.	106 40 15	3065	105 9 19	3073	103 38 32	3081	102 7 55	3090
28	a Arietis W.	72 27 45	3069	73 56 33	3074	75 25 14	3079	76 53 49	3083
	Aldebaran W.	39 9 17	3056	40 38 21	3060	42 7 20	3065	43 36 13	3068
	Regulus E.	40 59 27	3078	39 30 47	3086	38 2 20	3094	36 34 3	3105
	Saturn E.	88 7 56	3080	86 39 22	3085	85 10 54	3091	83 42 33	3097
	Venus E.	92 52 58	3293	91 30 34	3401	90 8 19	3408	88 46 11	3414
	Spica E.	94 37 8	3024	93 7 25	3029	91 37 48	3034	90 8 18	3041
	Jupiter E.	116 45 20	3104	115 57 15	3110	113 49 17	3115	112 21 26	3121
29	a Arietis W.	84 15 19	3106	85 43 22	3109	87 11 21	3111	88 39 17	3114
	Aldebaran W.	50 59 33	3095	52 28 1	3097	53 56 26	3091	55 24 47	3092
	Regulus E.	29 15 51	3160	27 48 54	3174	26 22 14	3188	24 55 51	3205
	Saturn E.	76 22 28	3130	74 54 43	3124	73 27 3	3128	71 59 27	3132
	Venus E.	81 57 15	3442	80 35 46	3446	79 14 21	3450	77 53 1	3454
	Spica E.	82 42 29	3064	81 13 35	3067	79 44 45	3070	78 15 59	3073
	Jupiter E.	105 3 45	3144	103 36 29	3148	102 9 17	3151	100 42 9	3153
	SUN E.	128 5 2	3440	126 43 41	3454	125 22 26	3468	124 1 15	3480
30	a Arietis W.	95 58 13	3123	97 25 55	3123	98 53 37	3123	100 21 19	3123
	Aldebaran W.	62 46 6	3097	64 14 19	3096	65 42 33	3096	67 10 48	3096
	Pollux W.	22 49 17	3236	24 7 12	3275	25 26 13	3294	26 46 10	3300
	Saturn E.	64 42 17	3141	63 14 57	3143	61 47 39	3143	60 20 21	3143
	Venus E.	71 7 13	3455	69 46 10	3467	68 25 9	3467	67 4 8	3467
	Spica E.	70 52 50	3061	69 24 17	3062	67 55 46	3061	66 27 13	3061
	Jupiter E.	93 27 6	3161	92 0 10	3161	90 33 14	3161	89 6 18	3161
	SUN E.	117 15 56	3459	115 54 57	3469	114 33 58	3469	113 12 59	3469

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
		^h ^m ^s	^s	[°] ['] ["]	["]	[°] ['] ["]	^s	^m ^s	^s
Tues.	1	16 28 29.72	10.792	S. 21° 47' 22.2	23.53	16 16.01	70.29	10 52.09	0.935
Wed.	2	16 32 49.11	10.819	21 56 34.9	22.48	16 16.16	70.37	10 29.31	0.962
Thur.	3	16 37 9.16	10.846	22 5 22.1	21.42	16 16.30	70.45	10 5.89	0.989
Fri.	4	16 41 29.84	10.871	22 13 43.7	20.35	16 16.43	70.53	9 41.84	1.014
Sat.	5	16 45 51.12	10.896	22 21 39.4	19.27	16 16.56	70.61	9 17.18	1.039
Sun.	6	16 50 12.96	10.919	22 29 9.0	18.17	16 16.68	70.68	8 51.96	1.062
Mon.	7	16 54 35.34	10.941	22 36 12.3	17.07	16 16.80	70.75	8 26.20	1.084
Tues.	8	16 58 58.26	10.961	22 42 49.1	15.96	16 16.92	70.81	7 59.92	1.104
Wed.	9	17 3 21.65	10.981	22 48 59.1	14.83	16 17.03	70.87	7 33.16	1.124
Thur.	10	17 7 45.49	10.999	22 54 42.0	13.71	16 17.14	70.93	7 5.95	1.142
Fri.	11	17 12 9.76	11.016	22 59 57.8	12.58	16 17.25	70.99	6 38.32	1.159
Sat.	12	17 16 34.40	11.031	23 4 46.2	11.43	16 17.36	71.04	6 10.31	1.174
Sun.	13	17 20 59.39	11.045	23 9 7.0	10.28	16 17.46	71.08	5 41.94	1.188
Mon.	14	17 25 24.70	11.057	23 13 0.2	9.12	16 17.56	71.12	5 13.27	1.200
Tues.	15	17 29 50.29	11.068	23 16 25.7	7.96	16 17.65	71.16	4 44.32	1.211
Wed.	16	17 34 16.13	11.077	23 19 23.3	6.80	16 17.74	71.20	4 15.12	1.220
Thur.	17	17 38 42.16	11.085	23 21 52.8	5.64	16 17.82	71.23	3 45.72	1.228
Fri.	18	17 43 8.36	11.091	23 23 54.2	4.47	16 17.90	71.25	3 16.16	1.234
Sat.	19	17 47 34.70	11.096	23 25 27.4	3.29	16 17.98	71.27	2 46.46	1.239
Sun.	20	17 52 1.14	11.099	23 26 32.4	2.11	16 18.05	71.29	2 16.65	1.242
Mon.	21	17 56 27.67	11.102	23 27 9.2	0.94	16 18.11	71.30	1 46.77	1.245
Tues.	22	18 0 54.23	11.102	23 27 17.7	0.24	16 18.17	71.30	1 16.85	1.246
Wed.	23	18 5 20.79	11.102	23 26 57.9	1.42	16 18.22	71.30	0 46.93	1.246
Thur.	24	18 9 47.34	11.100	23 26 9.8	2.60	16 18.27	71.29	0 17.02	1.244
Fri.	25	18 14 13.84	11.098	23 24 53.4	3.77	16 18.31	71.29	0 12.85	1.241
Sat.	26	18 18 40.26	11.094	23 23 8.8	4.95	16 18.34	71.28	0 42.62	1.237
Sun.	27	18 23 6.56	11.089	23 20 56.0	6.12	16 18.37	71.26	1 12.28	1.232
Mon.	28	18 27 32.71	11.082	23 18 15.0	7.29	16 18.39	71.23	1 41.80	1.225
Tues.	29	18 31 58.70	11.075	23 15 5.8	8.46	16 18.40	71.20	2 11.15	1.217
Wed.	30	18 36 24.49	11.066	23 11 28.6	9.62	16 18.41	71.17	2 40.30	1.209
Thur.	31	18 40 50.05	11.056	23 7 23.5	10.78	16 18.41	71.14	3 9.23	1.199
Fri.	32	18 45 15.35	11.044	S. 23 2 50.6	11.94	16 18.41	71.10	3 37.89	1.187

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to		Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	subtracted from Mean Time.			
Tues.	1	16 ^h 28 ^m 31.67 ^s	10.792	S. 21° 47' 26.5"	23.53	10 51.91	0.935	16 39 23.58	
Wed.	2	16 32 51.00	10.819	21 56 38.8	22.48	10 29.14	0.962	16 43 20.14	
Thur.	3	16 37 10.98	10.846	22 5 25.7	21.42	10 5.72	0.989	16 47 16.70	
Fri.	4	16 41 31.59	10.871	22 13 47.0	20.35	9 41.67	1.014	16 51 13.26	
Sat.	5	16 45 52.80	10.896	22 21 42.4	19.27	9 17.01	1.039	16 55 9.81	
Sun.	6	16 50 14.57	10.919	22 29 11.7	18.17	8 51.80	1.062	16 59 6.37	
Mon.	7	16 54 36.88	10.941	22 36 14.7	17.07	8 26.05	1.084	17 3 2.93	
Tues.	8	16 58 59.72	10.961	22 42 51.2	15.95	7 59.77	1.104	17 6 59.49	
Wed.	9	17 3 23.03	10.981	22 49 0.9	14.83	7 33.01	1.124	17 10 56.04	
Thur.	10	17 7 46.79	10.999	22 54 43.6	13.71	7 5.81	1.142	17 14 52.60	
Fri.	11	17 12 10.98	11.016	22 59 59.2	12.58	6 38.18	1.159	17 18 49.16	
Sat.	12	17 16 35.54	11.031	23 4 47.4	11.43	6 10.18	1.174	17 22 45.72	
Sun.	13	17 21 0.45	11.045	23 9 8.0	10.28	5 41.82	1.188	17 26 42.27	
Mon.	14	17 25 25.67	11.057	23 13 1.0	9.12	5 13.16	1.200	17 30 38.83	
Tues.	15	17 29 51.17	11.068	23 16 26.3	7.96	4 44.22	1.211	17 34 35.39	
Wed.	16	17 34 16.92	11.077	23 19 23.7	6.80	4 15.03	1.220	17 38 31.95	
Thur.	17	17 38 42.86	11.085	23 21 53.2	5.64	3 45.64	1.228	17 42 28.50	
Fri.	18	17 43 8.97	11.091	23 23 54.5	4.47	3 16.09	1.234	17 46 25.06	
Sat.	19	17 47 35.22	11.096	23 25 27.6	3.29	2 46.40	1.239	17 50 21.62	
Sun.	20	17 52 1.57	11.099	23 26 32.5	2.11	2 16.61	1.242	17 54 18.18	
Mon.	21	17 56 28.00	11.102	23 27 9.2	0.94	1 46.73	1.245	17 58 14.73	
Tues.	22	18 0 54.47	11.102	23 27 17.7	0.24	1 16.82	1.246	18 2 11.29	
Wed.	23	18 5 20.94	11.102	23 26 57.9	1.42	0 46.91	1.246	18 6 7.85	
Thur.	24	18 9 47.40	11.109	23 26 9.8	2.60	0 17.01	1.244	18 10 4.41	
Fri.	25	18 14 13.81	11.098	23 24 53.4	3.77	0 12.85	1.241	18 14 0.96	
Sat.	26	18 18 40.13	11.094	23 23 8.8	4.95	0 42.61	1.237	18 17 57.52	
Sun.	27	18 23 6.34	11.089	23 20 56.1	6.12	1 12.26	1.232	18 21 54.06	
Mon.	28	18 27 32.40	11.082	23 18 15.2	7.29	1 41.77	1.225	18 25 50.63	
Tues.	29	18 31 58.30	11.075	23 15 6.1	8.46	2 11.11	1.217	18 29 47.19	
Wed.	30	18 36 24.00	11.066	23 11 29.0	9.62	2 40.25	1.209	18 33 43.75	
Thur.	31	18 40 49.47	11.056	23 7 24.1	10.78	3 9.17	1.199	18 37 40.30	
Fri.	32	18 45 14.68	11.044	S. 23 2 51.4	11.94	3 37.82	1.187	18 41 36.86	

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	335	248° 51' 13.6	50' 13.7	152.14	—0.11	9.9937182	26.7	^h 7 ^m 19 ^s 24.23	
2	336	249 52 5.7	51 5.7	152.20	0.11	.9936551	25.9	7 15 28.32	
3	337	250 52 59.2	51 59.1	152.26	0.07	.9935939	25.1	7 11 32.41	
4	338	251 53 54.1	52 53.8	152.31	—0.02	.9935346	24.4	7 7 36.50	
5	339	252 54 50.2	53 49.7	152.36	+0.06	.9934771	23.6	7 3 40.58	
6	340	253 55 47.6	54 46.9	152.42	0.16	.9934214	22.9	6 59 44.67	
7	341	254 56 46.3	55 45.5	152.47	0.28	.9933673	22.2	6 55 48.76	
8	342	255 57 46.0	56 45.1	152.51	0.41	.9933148	21.5	6 51 52.85	
9	343	256 58 46.7	57 45.6	152.55	0.55	.9932638	20.9	6 47 56.94	
10	344	257 59 48.4	58 47.1	152.59	0.67	.9932143	20.3	6 44 1.02	
11	345	258 60 51.0	59 49.5	152.62	0.79	.9931662	19.7	6 40 5.11	
12	346	260 1 54.4	0 52.8	152.65	0.89	.9931196	19.1	6 36 9.20	
13	347	261 2 58.3	1 56.6	152.67	0.98	.9930746	18.4	6 32 13.29	
14	348	262 4 2.7	3 0.8	152.69	1.03	.9930313	17.7	6 28 17.38	
15	349	263 5 7.6	4 5.5	152.71	1.03	.9929897	17.0	6 24 21.46	
16	350	264 6 12.9	5 10.6	152.73	1.02	.9929499	16.2	6 20 25.55	
17	351	265 7 18.5	6 16.1	152.74	0.98	.9929120	15.4	6 16 29.64	
18	352	266 8 24.4	7 21.8	152.75	0.91	.9928762	14.4	6 12 33.73	
19	353	267 9 30.5	8 27.7	152.76	0.82	.9928427	13.4	6 8 37.82	
20	354	268 10 36.8	9 33.8	152.77	0.70	.9928117	12.4	6 4 41.91	
21	355	269 11 43.3	10 40.1	152.78	0.57	.9927833	11.3	6 0 46.00	
22	356	270 12 50.1	11 46.8	152.79	0.43	.9927575	10.2	5 56 50.09	
23	357	271 13 57.1	12 53.6	152.80	0.29	.9927342	9.1	5 52 54.18	
24	358	272 15 4.3	14 0.6	152.81	0.16	.9927138	8.0	5 48 58.27	
25	359	273 16 11.7	15 7.8	152.82	+0.05	.9926963	6.8	5 45 2.35	
26	360	274 17 19.4	16 15.3	152.83	—0.05	.9926816	5.6	5 41 6.44	
27	361	275 18 27.5	17 23.3	152.84	0.11	.9926698	4.4	5 37 10.53	
28	362	276 19 35.9	18 31.5	152.85	0.15	.9926608	3.2	5 33 14.62	
29	363	277 20 44.6	19 40.0	152.86	0.15	.9926544	2.1	5 29 18.71	
30	364	278 21 53.6	20 48.8	152.87	0.14	.9926508	1.0	5 25 22.80	
31	365	279 23 3.0	21 58.0	152.88	0.10	.9926497	0.0	5 21 26.89	
32	366	280 24 12.7	23 7.5	152.89	—0.02	9.9926509	1.0	5 17 30.98	

NOTE: λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S									
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.		
1	14 47.2	14 48.4	54 9.4	+0.24	54 13.6	+0.46	17 1.0	1.76	20.2	
2	14 50.2	14 52.8	54 20.4	0.67	54 29.8	0.89	17 43.2	1.76	21.2	
3	14 56.0	15 0.0	54 41.8	1.10	54 56.3	1.31	18 25.6	1.79	22.2	
4	15 4.6	15 9.9	55 13.3	1.51	55 32.6	1.70	19 9.2	1.85	23.2	
5	15 15.7	15 22.0	55 54.0	1.96	56 17.3	2.00	19 54.9	1.96	24.2	
6	15 28.8	15 35.9	56 42.1	2.11	57 8.0	2.19	20 43.6	2.10	25.2	
7	15 43.1	15 50.4	57 34.6	2.22	58 1.3	2.21	21 36.1	2.27	26.2	
8	15 57.5	16 4.4	58 27.6	2.14	58 52.8	2.03	22 32.4	2.42	27.2	
9	16 10.8	16 16.6	59 16.4	1.87	59 37.7	1.66	23 32.1	2.53	28.2	
10	16 21.7	16 25.8	59 56.3	1.40	60 11.5	1.11	6		29.2	
11	16 29.0	16 31.1	60 23.0	0.80	60 30.7	+0.48	0 33.6	2.57	0.7	
12	16 32.1	16 32.1	60 34.5	+0.15	60 34.4	-0.17	1 34.9	2.52	1.7	
13	16 31.0	16 29.0	60 30.4	-0.47	60 23.0	0.75	2 34.3	2.42	2.7	
14	16 26.1	16 22.5	60 12.4	0.99	59 59.2	1.20	3 30.7	2.29	3.7	
15	16 18.2	16 13.6	59 43.7	1.36	59 26.5	1.48	4 24.2	2.17	4.7	
16	16 8.6	16 3.4	59 8.2	1.56	58 49.0	1.61	5 15.2	2.09	5.7	
17	15 58.0	15 52.7	58 29.5	1.63	58 9.9	1.62	6 4.7	2.04	6.7	
18	15 47.4	15 42.3	57 50.5	1.60	57 31.5	1.56	6 53.5	2.03	7.7	
19	15 37.2	15 32.4	57 13.1	1.51	56 55.4	1.45	7 42.5	2.05	8.7	
20	15 27.8	15 23.3	56 38.2	1.39	56 22.0	1.33	8 32.0	2.08	9.7	
21	15 19.1	15 15.1	56 6.4	1.27	55 51.6	1.20	9 22.3	2.11	10.7	
22	15 11.2	15 7.6	55 37.5	1.14	55 24.2	1.08	10 13.1	2.12	11.7	
23	15 4.2	15 1.0	55 11.7	1.01	55 0.0	0.94	11 3.9	2.10	12.7	
24	14 58.0	14 55.3	54 49.0	0.87	54 39.0	0.80	11 53.9	2.06	13.7	
25	14 52.8	14 50.6	54 29.9	0.72	54 21.8	0.63	12 42.5	1.99	14.7	
26	14 48.7	14 47.1	54 14.8	0.53	54 9.0	0.42	13 29.3	1.91	15.7	
27	14 45.9	14 45.1	54 4.6	0.30	54 1.7	-0.17	14 14.2	1.84	16.7	
28	14 44.9	14 45.0	54 0.4	-0.03	54 1.0	+0.13	14 57.5	1.78	17.7	
29	14 45.6	14 46.9	54 3.5	+0.29	54 8.1	0.47	15 39.7	1.75	18.7	
30	14 48.7	14 51.2	54 14.9	0.66	54 23.9	0.85	16 21.5	1.75	19.7	
31	14 54.3	14 58.1	54 35.3	1.05	54 49.1	1.25	17 3.7	1.78	20.7	
32	15 2.5	15 7.5	55 5.4	+1.45	55 24.0	+1.65	17 47.3	1.86	21.7	

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 1.					THURSDAY 3.				
0	9 11 0.31	1.9043	N. 10 50 22.2	9.228	0	10 41 13.35	1.9749	N. 2 46 25.6	10.733
1	9 12 54.51	1.9025	10 41 7.5	9.267	1	10 43 5.86	1.9766	2 35 41.1	10.761
2	9 14 48.61	1.9007	10 31 50.2	9.310	2	10 44 58.42	1.9764	2 24 55.5	10.768
3	9 16 42.60	1.8990	10 22 30.3	9.353	3	10 46 51.02	1.9772	2 14 8.9	10.766
4	9 18 36.49	1.8974	10 13 7.8	9.396	4	10 48 43.68	1.9781	2 3 21.3	10.801
5	9 20 30.28	1.8958	10 3 42.8	9.438	5	10 50 36.40	1.9791	1 52 32.7	10.817
6	9 22 23.98	1.8943	9 54 15.2	9.480	6	10 52 29.17	1.9801	1 41 43.2	10.832
7	9 24 17.59	1.8928	9 44 45.1	9.523	7	10 54 22.01	1.9812	1 30 52.8	10.847
8	9 26 11.11	1.8913	9 35 12.6	9.562	8	10 56 14.91	1.9823	1 20 1.6	10.861
9	9 28 4.54	1.8899	9 25 37.7	9.602	9	10 58 7.88	1.9835	1 9 9.5	10.874
10	9 29 57.89	1.8885	9 16 0.4	9.641	10	11 0 0.93	1.9848	0 58 16.7	10.887
11	9 31 51.16	1.8872	9 6 20.8	9.680	11	11 1 54.05	1.9861	0 47 23.1	10.899
12	9 33 44.35	1.8859	8 56 38.8	9.718	12	11 3 47.26	1.9876	0 36 28.8	10.911
13	9 35 37.47	1.8847	8 46 54.6	9.756	13	11 5 40.55	1.9889	0 25 33.8	10.923
14	9 37 30.51	1.8835	8 37 8.1	9.793	14	11 7 33.93	1.9903	0 14 38.1	10.933
15	9 39 23.48	1.8823	8 27 19.4	9.829	15	11 9 27.40	1.9919	N. 0 3 41.8	10.943
16	9 41 16.39	1.8811	8 17 28.6	9.865	16	11 11 20.96	1.9935	S. 0 7 15.0	10.952
17	9 43 9.23	1.8801	8 7 35.6	9.901	17	11 13 14.62	1.9952	0 18 12.4	10.961
18	9 45 2.02	1.8793	7 57 40.5	9.936	18	11 15 8.39	1.9970	0 29 10.3	10.969
19	9 46 54.75	1.8784	7 47 43.3	9.970	19	11 17 2.26	1.9988	0 40 8.6	10.976
20	9 48 47.43	1.8776	7 37 44.1	10.004	20	11 18 56.25	1.9907	0 51 7.4	10.983
21	9 50 40.05	1.8767	7 27 42.9	10.037	21	11 20 50.35	1.9927	1 2 6.5	10.988
22	9 52 32.63	1.8759	7 17 39.7	10.070	22	11 22 44.57	1.9947	1 13 6.0	10.994
23	9 54 25.16	1.8752	N. 7 7 34.5	10.103	23	11 24 38.91	1.9968	S. 1 24 5.8	10.999
WEDNESDAY 2.					FRIDAY 4.				
0	9 56 17.65	1.8745	N. 6 57 27.4	10.134	0	11 26 33.38	1.9989	S. 1 35 5.9	11.003
1	9 58 10.10	1.8739	6 47 18.4	10.165	1	11 28 27.97	1.9910	1 46 6.2	11.007
2	10 0 2.52	1.8733	6 37 7.6	10.196	2	11 30 22.70	1.9933	1 57 6.7	11.010
3	10 1 54.90	1.8728	6 26 55.0	10.226	3	11 32 17.57	1.9956	2 8 7.3	11.012
4	10 3 47.26	1.8724	6 16 40.5	10.256	4	11 34 12.57	1.9979	2 19 8.1	11.013
5	10 5 39.59	1.8720	6 6 24.3	10.286	5	11 36 7.72	1.9903	2 30 8.9	11.014
6	10 7 31.90	1.8716	5 56 6.3	10.315	6	11 38 3.01	1.9928	2 41 9.8	11.014
7	10 9 24.19	1.8713	5 45 46.7	10.341	7	11 39 58.45	1.9953	2 52 10.6	11.013
8	10 11 16.46	1.8711	5 35 25.4	10.368	8	11 41 54.05	1.9980	3 3 11.4	11.012
9	10 13 8.72	1.8709	5 25 2.5	10.395	9	11 43 49.81	1.9907	3 14 12.1	11.011
10	10 15 0.97	1.8708	5 14 38.0	10.421	10	11 45 45.73	1.9934	3 25 12.7	11.008
11	10 16 53.22	1.8707	5 4 11.9	10.447	11	11 47 41.81	1.9962	3 36 13.1	11.004
12	10 18 45.46	1.8707	4 53 44.3	10.473	12	11 49 38.07	1.9991	3 47 13.2	11.000
13	10 20 37.70	1.8707	4 43 15.2	10.497	13	11 51 34.50	1.9920	3 58 13.1	10.996
14	10 22 29.95	1.8708	4 32 44.6	10.521	14	11 53 31.11	1.9950	4 9 12.7	10.990
15	10 24 22.21	1.8710	4 22 12.6	10.545	15	11 55 27.90	1.9980	4 20 11.9	10.984
16	10 26 14.47	1.8712	4 11 39.2	10.568	16	11 57 24.87	1.9911	4 31 10.8	10.977
17	10 28 6.75	1.8714	4 1 4.4	10.591	17	11 59 22.03	1.9943	4 42 9.2	10.969
18	10 29 59.04	1.8717	3 50 28.3	10.613	18	12 1 19.39	1.9975	4 53 7.1	10.961
19	10 31 51.35	1.8721	3 39 50.9	10.633	19	12 3 16.94	1.9908	5 4 4.5	10.952
20	10 33 43.69	1.8725	3 29 12.3	10.654	20	12 5 14.69	1.9943	5 15 1.3	10.943
21	10 35 36.05	1.8730	3 18 32.4	10.675	21	12 7 12.65	1.9977	5 25 57.5	10.931
22	10 37 28.45	1.8735	3 7 51.3	10.695	22	12 9 10.81	1.9712	5 36 53.0	10.919
23	10 39 20.88	1.8742	2 57 9.0	10.714	23	12 11 9.18	1.9747	5 47 47.8	10.907
24	10 41 13.35	1.8749	N. 2 46 25.6	10.733	24	12 13 7.77	1.9783	S. 5 58 41.8	10.894

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 5.					MONDAY 7.				
0	12 13 7.77	1.9783	S. 5 58 41.8	10.884	0	13 53 19.53	2.2169	S. 14 8 44.6	9.126
1	12 15 6.57	1.9819	6 9 35.0	10.880	1	13 55 32.66	2.2219	14 17 50.2	9.062
2	12 17 5.60	1.9857	6 20 27.4	10.864	2	13 57 46.16	2.2279	14 26 52.0	8.997
3	12 19 4.86	1.9895	6 31 18.8	10.848	3	14 0 0.02	2.2340	14 35 49.8	8.930
4	12 21 4.34	1.9933	6 42 9.2	10.831	4	14 2 14.24	2.2401	14 44 43.6	8.862
5	12 23 4.06	1.9973	6 52 58.6	10.814	5	14 4 28.83	2.2462	14 53 33.2	8.798
6	12 25 4.01	2.0013	7 3 46.9	10.796	6	14 6 43.79	2.2523	15 2 18.7	8.733
7	12 27 4.20	2.0052	7 14 34.1	10.777	7	14 8 59.12	2.2584	15 10 59.9	8.661
8	12 29 4.63	2.0093	7 25 20.1	10.757	8	14 11 14.81	2.2646	15 19 36.8	8.578
9	12 31 5.31	2.0134	7 36 4.9	10.736	9	14 13 30.87	2.2708	15 28 9.3	8.503
10	12 33 6.24	2.0176	7 46 48.4	10.714	10	14 15 47.31	2.2770	15 36 37.2	8.427
11	12 35 7.43	2.0219	7 57 30.5	10.691	11	14 18 4.12	2.2832	15 45 0.5	8.350
12	12 37 8.87	2.0263	8 8 11.3	10.667	12	14 20 21.30	2.2894	15 53 19.2	8.272
13	12 39 10.58	2.0307	8 18 50.6	10.643	13	14 22 38.86	2.2957	16 1 33.2	8.192
14	12 41 12.55	2.0351	8 29 28.4	10.617	14	14 24 56.79	2.3019	16 9 42.3	8.111
15	12 43 14.79	2.0396	8 40 4.7	10.591	15	14 27 15.09	2.3082	16 17 46.5	8.028
16	12 45 17.30	2.0442	8 50 39.3	10.563	16	14 29 33.77	2.3144	16 25 45.7	7.944
17	12 47 20.09	2.0488	9 1 12.3	10.536	17	14 31 52.82	2.3207	16 33 39.9	7.860
18	12 49 23.15	2.0536	9 11 43.5	10.506	18	14 34 12.25	2.3269	16 41 28.9	7.774
19	12 51 26.50	2.0582	9 22 13.0	10.476	19	14 36 32.05	2.3332	16 49 12.7	7.686
20	12 53 30.13	2.0630	9 32 40.6	10.446	20	14 38 52.23	2.3394	16 56 51.2	7.597
21	12 55 34.05	2.0678	9 43 6.3	10.412	21	14 41 12.78	2.3457	17 4 24.3	7.506
22	12 57 38.26	2.0726	9 53 30.1	10.378	22	14 43 33.71	2.3519	17 11 51.9	7.414
23	12 59 42.76	2.0775	S. 10 3 51.8	10.344	23	14 45 55.00	2.3580	S. 17 19 14.0	7.322
SUNDAY 6.					TUESDAY 8.				
0	13 1 47.56	2.0825	S. 10 14 11.4	10.309	0	14 48 16.67	2.3643	S. 17 26 30.5	7.228
1	13 3 52.66	2.0876	10 24 28.9	10.273	1	14 50 38.71	2.3704	17 33 41.3	7.133
2	13 5 58.07	2.0927	10 34 44.1	10.236	2	14 53 1.12	2.3766	17 40 46.3	7.036
3	13 8 3.78	2.0978	10 44 57.1	10.197	3	14 55 23.90	2.3827	17 47 45.4	6.936
4	13 10 9.80	2.1030	10 55 7.7	10.157	4	14 57 47.05	2.3889	17 54 38.6	6.837
5	13 12 16.14	2.1083	11 5 15.9	10.116	5	15 0 10.57	2.3950	18 1 25.8	6.736
6	13 14 22.79	2.1136	11 15 21.6	10.074	6	15 2 34.45	2.4011	18 8 6.9	6.633
7	13 16 29.76	2.1189	11 25 24.8	10.032	7	15 4 58.69	2.4071	18 14 41.8	6.529
8	13 18 37.05	2.1243	11 35 25.4	9.986	8	15 7 23.30	2.4131	18 21 10.4	6.424
9	13 20 44.67	2.1297	11 45 23.3	9.943	9	15 9 48.27	2.4191	18 27 32.7	6.318
10	13 22 52.61	2.1352	11 55 18.5	9.897	10	15 12 13.59	2.4251	18 33 48.6	6.210
11	13 25 0.88	2.1407	12 5 10.9	9.849	11	15 14 39.27	2.4310	18 39 57.9	6.101
12	13 27 9.49	2.1463	12 15 0.4	9.800	12	15 17 5.30	2.4369	18 46 0.7	5.991
13	13 29 18.43	2.1518	12 24 47.0	9.751	13	15 19 31.69	2.4427	18 51 56.8	5.879
14	13 31 27.71	2.1574	12 34 30.5	9.701	14	15 21 58.42	2.4484	18 57 46.2	5.766
15	13 33 37.32	2.1631	12 44 11.0	9.648	15	15 24 25.49	2.4541	19 3 28.7	5.652
16	13 35 47.28	2.1688	12 53 48.3	9.596	16	15 26 52.91	2.4598	19 9 4.4	5.537
17	13 37 57.58	2.1746	13 3 22.4	9.541	17	15 29 20.67	2.4654	19 14 33.1	5.420
18	13 40 8.23	2.1804	13 12 53.2	9.485	18	15 31 48.76	2.4710	19 19 54.8	5.302
19	13 42 19.23	2.1863	13 22 20.6	9.428	19	15 34 17.19	2.4766	19 25 9.3	5.183
20	13 44 30.58	2.1921	13 31 44.6	9.370	20	15 36 45.94	2.4819	19 30 16.7	5.063
21	13 46 42.28	2.1980	13 41 5.0	9.311	21	15 39 15.02	2.4873	19 35 16.8	4.941
22	13 48 54.34	2.2039	13 50 21.9	9.251	22	15 41 44.42	2.4926	19 40 9.6	4.818
23	13 51 6.76	2.2099	13 59 35.1	9.189	23	15 44 14.13	2.4978	19 44 55.0	4.694
24	13 53 19.53	2.2159	S. 14 8 44.6	9.126	24	15 46 44.16	2.5030	S. 19 49 32.9	4.569

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 9.					FRIDAY 11.				
0	15 46 44.16	2.6030	S. 19° 49' 32.9	4.569	0	17 51 2.71	2.6322	S. 20° 47' 55.4	2.330
1	15 49 14.50	2.6032	19 54 3.2	4.442	1	17 53 40.64	2.6319	20 45 29.9	2.501
2	15 51 45.14	2.6133	19 58 26.0	4.315	2	17 56 18.54	2.6314	20 42 55.3	2.632
3	15 54 16.09	2.6133	20 2 41.1	4.187	3	17 58 56.41	2.6308	20 40 11.7	2.802
4	15 56 47.33	2.6231	20 6 48.5	4.058	4	18 1 34.24	2.6301	20 37 19.1	2.963
5	15 59 18.86	2.6279	20 10 48.1	3.927	5	18 4 12.03	2.6293	20 34 17.4	3.103
6	16 1 50.68	2.6326	20 14 39.8	3.795	6	18 6 49.76	2.6283	20 31 6.8	3.262
7	16 4 22.78	2.6373	20 18 23.5	3.662	7	18 9 27.43	2.6272	20 27 47.2	3.401
8	16 6 55.16	2.6419	20 21 59.3	3.528	8	18 12 5.03	2.6260	20 24 18.7	3.550
9	16 9 27.81	2.6463	20 25 27.0	3.394	9	18 14 42.56	2.6247	20 20 41.3	3.698
10	16 12 0.72	2.6506	20 28 46.6	3.260	10	18 17 20.00	2.6233	20 16 55.0	3.845
11	16 14 33.89	2.6549	20 31 58.1	3.123	11	18 19 57.35	2.6217	20 12 59.9	3.992
12	16 17 7.31	2.6591	20 35 1.3	2.985	12	18 22 34.61	2.6200	20 8 56.0	4.138
13	16 19 40.98	2.6632	20 37 56.3	2.847	13	18 25 11.77	2.6183	20 4 43.3	4.284
14	16 22 14.89	2.6672	20 40 42.9	2.708	14	18 27 48.81	2.6164	20 0 21.9	4.429
15	16 24 49.04	2.6711	20 43 21.1	2.567	15	18 30 25.74	2.6144	19 55 51.8	4.573
16	16 27 23.42	2.6749	20 45 50.9	2.426	16	18 33 2.54	2.6123	19 51 13.1	4.717
17	16 29 58.02	2.6786	20 48 12.2	2.284	17	18 35 39.21	2.6101	19 46 25.8	4.860
18	16 32 32.84	2.6820	20 50 25.0	2.141	18	18 38 15.75	2.6078	19 41 29.9	5.002
19	16 35 7.87	2.6855	20 52 29.2	1.997	19	18 40 52.15	2.6054	19 36 25.5	5.143
20	16 37 43.10	2.6888	20 54 24.7	1.853	20	18 43 28.40	2.6029	19 31 12.7	5.283
21	16 40 18.52	2.6920	20 56 11.6	1.708	21	18 46 4.50	2.6003	19 25 51.5	5.423
22	16 42 54.14	2.6951	20 57 49.7	1.563	22	18 48 40.43	2.5976	19 20 21.9	5.563
23	16 45 29.94	2.6981	S. 20° 59' 19.1	1.417	23	18 51 16.20	2.5947	S. 19° 14' 44.0	5.700
THURSDAY 10.					SATURDAY 12.				
0	16 48 5.92	2.6010	S. 21° 0' 39.7	1.370	0	18 53 51.79	2.5917	S. 19° 8' 57.9	5.837
1	16 50 42.06	2.6037	21 1 51.5	1.123	1	18 56 27.20	2.5897	19 3 3.6	5.972
2	16 53 18.37	2.6063	21 2 54.4	0.975	2	18 59 2.43	2.5865	18 57 1.2	6.105
3	16 55 54.83	2.6089	21 3 48.5	0.826	3	19 1 37.47	2.5834	18 50 50.8	6.240
4	16 58 31.44	2.6113	21 4 33.6	0.677	4	19 4 12.31	2.5791	18 44 32.4	6.373
5	17 1 8.18	2.6135	21 5 9.8	0.528	5	19 6 46.95	2.5757	18 38 6.0	6.506
6	17 3 45.06	2.6166	21 5 37.0	0.379	6	19 9 21.39	2.5723	18 31 31.8	6.638
7	17 6 22.06	2.6177	21 5 55.3	0.229	7	19 11 55.61	2.5688	18 24 49.8	6.764
8	17 8 59.18	2.6196	21 6 4.5	0.078	8	19 14 29.62	2.5650	18 18 0.1	6.892
9	17 11 36.41	2.6218	21 6 4.7	0.073	9	19 17 3.41	2.5618	18 11 2.7	7.020
10	17 14 13.74	2.6239	21 5 55.8	0.224	10	19 19 36.97	2.5575	18 3 57.7	7.146
11	17 16 51.16	2.6244	21 5 37.8	0.375	11	19 22 10.31	2.5537	17 56 45.2	7.270
12	17 19 28.67	2.6268	21 5 10.8	0.526	12	19 24 43.41	2.5498	17 49 25.3	7.394
13	17 22 6.26	2.6271	21 4 34.7	0.678	13	19 27 16.28	2.5468	17 41 58.0	7.516
14	17 24 43.92	2.6283	21 3 49.4	0.830	14	19 29 48.91	2.5417	17 34 23.4	7.638
15	17 27 21.64	2.6292	21 2 55.1	0.982	15	19 32 21.29	2.5376	17 26 41.7	7.764
16	17 29 59.42	2.6301	21 1 51.6	1.134	16	19 34 53.43	2.5335	17 18 52.8	7.873
17	17 32 37.24	2.6308	21 0 39.0	1.287	17	19 37 25.32	2.5293	17 10 56.9	7.980
18	17 35 15.11	2.6314	20 59 17.2	1.439	18	19 39 56.95	2.5251	17 2 54.0	8.105
19	17 37 53.01	2.6318	20 57 46.4	1.590	19	19 42 28.33	2.5208	16 54 44.2	8.230
20	17 40 30.93	2.6321	20 56 6.4	1.742	20	19 44 59.45	2.5165	16 46 27.6	8.353
21	17 43 8.87	2.6324	20 54 17.3	1.894	21	19 47 30.31	2.5121	16 38 4.3	8.444
22	17 45 46.82	2.6324	20 52 19.1	2.046	22	19 50 0.90	2.5077	16 29 34.4	8.584
23	17 48 24.77	2.6324	20 50 11.8	2.198	23	19 52 31.22	2.5033	16 20 57.9	8.693
24	17 51 2.71	2.6322	S. 20° 47' 55.4	2.350	24	19 55 1.28	2.4987	S. 16° 12' 15.0	8.799

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 13.					TUESDAY 15.				
0	^h 19 ^m 55 ^s 1.28	2.4967	S. 16° 12' 15.0"	8.760	0	^h 21 ^m 49 ^s 31.84	2.2774	S. 7° 36' 25.4"	12.142
1	19 57 31.06	2.4941	16 3 25.7	8.874	1	21 51 48.36	2.2784	7 24 15.8	12.176
2	20 0 0.57	2.4906	15 54 30.1	9.078	2	21 54 4.65	2.2804	7 12 4.3	12.208
3	20 2 29.80	2.4848	15 45 28.3	9.081	3	21 56 20.70	2.2856	6 59 50.9	12.238
4	20 4 58.75	2.4802	15 36 20.3	9.183	4	21 58 36.51	2.2616	6 47 35.7	12.267
5	20 7 27.42	2.4766	15 27 6.3	9.283	5	22 0 52.09	2.2678	6 35 18.7	12.296
6	20 9 55.81	2.4706	15 17 46.3	9.381	6	22 3 7.45	2.2641	6 23 0.1	12.323
7	20 12 23.91	2.4600	15 8 20.5	9.478	7	22 5 22.59	2.2604	6 10 39.9	12.348
8	20 14 51.73	2.4612	14 58 48.9	9.574	8	22 7 37.50	2.2467	5 58 18.3	12.373
9	20 17 19.26	2.4564	14 49 11.6	9.668	9	22 9 52.19	2.2431	5 45 55.2	12.396
10	20 19 46.50	2.4517	14 39 28.7	9.760	10	22 12 6.67	2.2396	5 33 30.8	12.417
11	20 22 13.46	2.4469	14 29 40.3	9.861	11	22 14 20.93	2.2360	5 21 5.2	12.437
12	20 24 40.13	2.4421	14 19 46.6	9.940	12	22 16 34.99	2.2326	5 8 38.4	12.456
13	20 27 6.51	2.4373	14 9 47.5	10.028	13	22 18 48.84	2.2292	4 56 10.5	12.473
14	20 29 32.60	2.4326	13 59 43.2	10.114	14	22 21 2.49	2.2256	4 43 41.6	12.489
15	20 31 58.40	2.4277	13 49 33.8	10.199	15	22 23 15.94	2.2226	4 31 11.8	12.504
16	20 34 23.92	2.4229	13 39 19.3	10.282	16	22 25 29.20	2.2194	4 18 41.1	12.518
17	20 36 49.15	2.4180	13 28 59.9	10.364	17	22 27 42.26	2.2169	4 6 9.6	12.530
18	20 39 14.08	2.4132	13 18 35.6	10.444	18	22 29 55.14	2.2131	3 53 37.5	12.541
19	20 41 38.72	2.4083	13 8 6.6	10.523	19	22 32 7.83	2.2100	3 41 4.7	12.551
20	20 44 3.08	2.4036	12 57 32.9	10.600	20	22 34 20.34	2.2070	3 28 31.4	12.560
21	20 46 27.15	2.3987	12 46 54.6	10.675	21	22 36 32.67	2.2041	3 15 57.6	12.567
22	20 48 50.93	2.3939	12 36 11.9	10.749	22	22 38 44.83	2.2012	3 3 23.4	12.573
23	20 51 14.42	2.3892	S. 12° 25' 24.8"	10.821	23	22 40 56.81	2.1983	S. 2° 50' 48.9"	12.577
MONDAY 14.					WEDNESDAY 16.				
0	20 53 37.63	2.3844	S. 12° 14' 33.4"	10.892	0	22 43 8.63	2.1956	S. 2° 38' 14.2"	12.580
1	20 56 0.55	2.3796	12 3 37.8	10.962	1	22 45 20.28	2.1928	2 25 39.3	12.583
2	20 58 23.18	2.3748	11 52 38.0	11.030	2	22 47 31.77	2.1902	2 13 4.3	12.583
3	21 0 45.53	2.3701	11 41 34.2	11.096	3	22 49 43.10	2.1876	2 0 29.2	12.584
4	21 3 7.60	2.3654	11 30 26.5	11.161	4	22 51 54.28	2.1860	1 47 54.2	12.583
5	21 5 29.39	2.3607	11 19 14.9	11.224	5	22 54 5.30	2.1826	1 35 19.3	12.580
6	21 7 50.89	2.3560	11 7 59.6	11.286	6	22 56 16.18	2.1801	1 22 44.6	12.576
7	21 10 12.11	2.3513	10 56 40.6	11.346	7	22 58 26.92	2.1778	1 10 10.1	12.573
8	21 12 33.05	2.3467	10 45 18.1	11.406	8	23 0 37.51	2.1754	0 57 36.0	12.568
9	21 14 53.71	2.3421	10 33 52.1	11.462	9	23 2 47.96	2.1731	0 45 2.3	12.566
10	21 17 14.10	2.3376	10 22 22.7	11.518	10	23 4 58.28	2.1709	0 32 29.0	12.549
11	21 19 34.22	2.3330	10 10 50.0	11.572	11	23 7 8.47	2.1688	0 19 56.3	12.540
12	21 21 54.06	2.3286	9 59 14.1	11.626	12	23 9 18.53	2.1667	S. 0° 7' 24.2"	12.530
13	21 24 13.63	2.3240	9 47 35.1	11.676	13	23 11 28.47	2.1646	N. 0° 5' 7.3"	12.518
14	21 26 32.94	2.3196	9 35 53.0	11.726	14	23 13 38.28	2.1627	0 17 38.0	12.506
15	21 28 51.99	2.3152	9 24 8.0	11.774	15	23 15 47.98	2.1608	0 30 8.0	12.492
16	21 31 10.77	2.3108	9 12 20.2	11.821	16	23 17 57.57	2.1589	0 42 37.1	12.478
17	21 33 29.29	2.3064	9 0 29.6	11.868	17	23 20 7.05	2.1571	0 55 5.3	12.462
18	21 35 47.55	2.3020	8 48 36.3	11.910	18	23 22 16.42	2.1554	1 7 32.5	12.445
19	21 38 5.56	2.2980	8 36 40.4	11.962	19	23 24 25.69	2.1538	1 19 58.6	12.426
20	21 40 23.31	2.2938	8 24 42.1	11.993	20	23 26 34.87	2.1522	1 32 23.6	12.407
21	21 42 40.81	2.2896	8 12 41.3	12.033	21	23 28 43.95	2.1506	1 44 47.4	12.387
22	21 44 58.07	2.2855	8 0 38.2	12.071	22	23 30 52.94	2.1491	1 57 10.0	12.366
23	21 47 15.08	2.2814	7 48 32.9	12.107	23	23 33 1.84	2.1477	2 9 31.2	12.343
24	21 49 31.84	2.2774	S. 7° 36' 25.4"	12.142	24	23 35 10.66	2.1463	N. 2° 21' 51.1"	12.319

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 17.					SATURDAY 19.				
0	23 35 10.66	2.1463	N. 2 21 51.1	12.319	0	1 17 34.89	2.1380	N. 11 28 6.8	16.101
1	23 37 19.39	2.1449	2 34 9.5	12.295	1	1 19 43.20	2.1389	11 38 10.9	16.084
2	23 39 28.05	2.1436	2 46 26.5	12.269	2	1 21 51.56	2.1398	11 48 10.9	9.966
3	23 41 36.63	2.1424	2 58 41.9	12.243	3	1 23 59.97	2.1407	11 58 6.9	9.898
4	23 43 45.14	2.1412	3 10 55.7	12.216	4	1 26 8.44	2.1416	12 7 58.7	9.829
5	23 45 53.58	2.1401	3 23 7.8	12.187	5	1 28 16.96	2.1425	12 17 46.4	9.760
6	23 48 1.95	2.1391	3 35 18.2	12.157	6	1 30 25.54	2.1434	12 27 29.9	9.690
7	23 50 10.26	2.1384	3 47 26.8	12.127	7	1 32 34.17	2.1443	12 37 9.1	9.618
8	23 52 18.52	2.1372	3 59 33.5	12.096	8	1 34 42.86	2.1453	12 46 44.0	9.546
9	23 54 26.72	2.1363	4 11 38.3	12.063	9	1 36 51.61	2.1463	12 56 14.6	9.473
10	23 56 34.87	2.1354	4 23 41.1	12.030	10	1 39 0.42	2.1474	13 5 40.8	9.399
11	23 58 42.97	2.1346	4 35 41.9	11.996	11	1 41 9.30	2.1485	13 15 2.5	9.325
12	0 0 51.02	2.1339	4 47 40.6	11.961	12	1 43 18.24	2.1496	13 24 19.8	9.250
13	0 2 59.63	2.1333	4 59 37.1	11.924	13	1 45 27.25	2.1507	13 33 32.5	9.174
14	0 5 7.00	2.1326	5 11 31.5	11.887	14	1 47 36.32	2.1518	13 42 40.7	9.098
15	0 7 14.94	2.1320	5 23 23.6	11.849	15	1 49 45.46	2.1529	13 51 44.3	9.022
16	0 9 22.84	2.1314	5 35 13.4	11.810	16	1 51 54.66	2.1540	14 0 43.3	8.946
17	0 11 30.71	2.1309	5 47 0.8	11.770	17	1 54 3.93	2.1552	14 9 37.6	8.866
18	0 13 38.55	2.1305	5 58 45.8	11.729	18	1 56 13.28	2.1563	14 18 27.2	8.787
19	0 15 46.37	2.1302	6 10 28.3	11.688	19	1 58 22.69	2.1575	14 27 12.0	8.707
20	0 17 54.17	2.1298	6 22 8.3	11.646	20	2 0 32.18	2.1587	14 35 52.0	8.626
21	0 20 1.95	2.1295	6 33 45.7	11.602	21	2 2 41.74	2.1599	14 44 27.1	8.546
22	0 22 9.71	2.1293	6 45 20.5	11.557	22	2 4 51.37	2.1611	14 52 57.4	8.463
23	0 24 17.46	2.1291	N. 6 56 52.6	11.513	23	2 7 1.07	2.1623	N. 15 1 22.8	8.381
FRIDAY 18.					SUNDAY 20.				
0	0 26 25.21	2.1280	N. 7 8 21.9	11.466	0	2 9 10.85	2.1635	N. 15 9 43.2	8.298
1	0 28 32.95	2.1289	7 19 48.4	11.418	1	2 11 20.70	2.1648	15 17 58.6	8.214
2	0 30 40.68	2.1289	7 31 12.1	11.370	2	2 13 30.63	2.1660	15 26 8.9	8.130
3	0 32 48.41	2.1289	7 42 32.8	11.321	3	2 15 40.63	2.1673	15 34 14.2	8.046
4	0 34 56.15	2.1290	7 53 50.6	11.271	4	2 17 50.71	2.1685	15 42 14.4	7.961
5	0 37 3.89	2.1291	8 5 5.4	11.221	5	2 20 0.86	2.1698	15 50 9.4	7.874
6	0 39 11.64	2.1292	8 16 17.1	11.170	6	2 22 11.09	2.1710	15 57 59.3	7.787
7	0 41 19.39	2.1293	8 27 25.7	11.117	7	2 24 21.39	2.1723	16 5 43.9	7.700
8	0 43 27.16	2.1295	8 38 31.1	11.068	8	2 26 31.76	2.1734	16 13 23.3	7.612
9	0 45 34.94	2.1298	8 49 33.3	11.009	9	2 28 42.21	2.1747	16 20 57.4	7.523
10	0 47 42.74	2.1301	9 0 32.2	10.954	10	2 30 52.73	2.1759	16 28 26.1	7.434
11	0 49 50.55	2.1304	9 11 27.8	10.899	11	2 33 3.33	2.1772	16 35 49.5	7.345
12	0 51 58.39	2.1308	9 22 20.1	10.843	12	2 35 14.00	2.1784	16 43 7.5	7.256
13	0 54 6.25	2.1313	9 33 8.9	10.786	13	2 37 24.75	2.1797	16 50 20.1	7.164
14	0 56 14.14	2.1317	9 43 54.3	10.727	14	2 39 35.57	2.1809	16 57 27.2	7.073
15	0 58 22.06	2.1323	9 54 36.2	10.668	15	2 41 46.46	2.1823	17 4 28.8	6.980
16	1 0 30.00	2.1327	10 5 14.5	10.608	16	2 43 57.43	2.1834	17 11 24.8	6.888
17	1 2 37.98	2.1332	10 15 49.2	10.547	17	2 46 8.47	2.1846	17 18 15.3	6.796
18	1 4 45.99	2.1338	10 26 20.2	10.486	18	2 48 19.58	2.1858	17 25 0.2	6.703
19	1 6 54.04	2.1344	10 36 47.5	10.424	19	2 50 30.76	2.1870	17 31 39.5	6.608
20	1 9 2.12	2.1351	10 47 11.1	10.361	20	2 52 42.02	2.1882	17 38 13.2	6.514
21	1 11 10.25	2.1358	10 57 30.8	10.297	21	2 54 53.35	2.1893	17 44 41.2	6.419
22	1 13 18.42	2.1365	11 7 46.7	10.233	22	2 57 4.74	2.1904	17 51 3.5	6.323
23	1 15 26.63	2.1372	11 17 58.7	10.167	23	2 59 16.20	2.1915	17 57 20.0	6.227
24	1 17 34.89	2.1380	N. 11 28 6.8	10.101	24	3 1 27.73	2.1926	N. 18 3 30.8	6.131

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 21.					WEDNESDAY 23.				
0	3 1 27.73	2.1926	N.18° 3 30.8	5.181	0	4 47 26.22	2.2066	N.21° 0' 6.5	1.141
1	3 3 39.32	2.1947	18 9 35.8	6.084	1	4 49 38.72	2.2079	21 1 11.7	1.083
2	3 5 50.98	2.1948	18 15 34.9	5.987	2	4 51 51.17	2.2072	21 2 10.5	0.996
3	3 8 2.70	2.1968	18 21 28.2	5.840	3	4 54 3.58	2.2064	21 3 2.9	0.920
4	3 10 14.48	2.1988	18 27 15.7	5.742	4	4 56 15.94	2.2066	21 3 48.9	0.713
5	3 12 26.32	2.1978	18 32 57.3	5.643	5	4 58 28.25	2.2047	21 4 28.5	0.606
6	3 14 38.22	2.1988	18 38 32.9	5.544	6	5 0 40.50	2.2038	21 5 1.6	0.499
7	3 16 50.18	2.1997	18 44 2.5	5.444	7	5 2 52.70	2.2028	21 5 28.3	0.388
8	3 19 2.19	2.2007	18 49 26.2	5.344	8	5 5 4.84	2.2018	21 5 48.7	0.286
9	3 21 14.26	2.2016	18 54 43.9	5.244	9	5 7 16.92	2.2007	21 6 2.7	0.180
10	3 23 26.38	2.2026	18 59 55.5	5.143	10	5 9 28.93	2.1996	21 6 10.3	0.074
11	3 25 38.55	2.2033	19 5 1.1	5.043	11	5 11 40.88	2.1986	21 6 11.5	0.032
12	3 27 50.77	2.2041	19 10 0.6	4.941	12	5 13 52.75	2.1973	21 6 6.4	0.138
13	3 30 3.04	2.2049	19 14 54.0	4.839	13	5 16 4.55	2.1960	21 5 54.9	0.244
14	3 32 15.36	2.2067	19 19 41.3	4.737	14	5 18 16.27	2.1947	21 5 37.1	0.350
15	3 34 27.72	2.2064	19 24 22.5	4.636	15	5 20 27.91	2.1933	21 5 13.0	0.455
16	3 36 40.13	2.2071	19 28 57.5	4.533	16	5 22 39.46	2.1919	21 4 42.5	0.560
17	3 38 52.58	2.2077	19 33 26.3	4.429	17	5 24 50.93	2.1904	21 4 5.7	0.665
18	3 41 5.06	2.2084	19 37 49.0	4.326	18	5 27 2.31	2.1889	21 3 22.7	0.769
19	3 43 17.58	2.2090	19 42 5.5	4.222	19	5 29 13.60	2.1874	21 2 33.4	0.873
20	3 45 30.14	2.2096	19 46 15.7	4.118	20	5 31 24.79	2.1858	21 1 37.9	0.977
21	3 47 42.73	2.2100	19 50 19.7	4.014	21	5 33 35.89	2.1842	21 0 36.1	1.081
22	3 49 55.34	2.2105	19 54 17.4	3.910	22	5 35 46.89	2.1825	20 59 28.1	1.185
23	3 52 7.99	2.2110	N.19 58 8.9	3.806	23	5 37 57.79	2.1808	N.20 58 13.9	1.288
TUESDAY 22.					THURSDAY 24.				
0	3 54 20.66	2.2114	N.20 1 54.1	3.701	0	5 40 8.58	2.1790	N.20 56 53.5	1.391
1	3 56 33.35	2.2117	20 5 33.0	3.606	1	5 42 19.26	2.1772	20 55 26.9	1.494
2	3 58 46.07	2.2121	20 9 5.6	3.501	2	5 44 29.84	2.1754	20 53 54.2	1.596
3	4 0 58.81	2.2124	20 12 31.9	3.395	3	5 46 40.31	2.1736	20 52 15.4	1.698
4	4 3 11.56	2.2127	20 15 51.8	3.279	4	5 48 50.66	2.1716	20 50 30.4	1.800
5	4 5 24.33	2.2129	20 19 5.4	3.173	5	5 51 0.00	2.1696	20 48 39.4	1.901
6	4 7 37.11	2.2131	20 22 12.6	3.067	6	5 53 11.01	2.1675	20 46 42.3	2.002
7	4 9 49.90	2.2133	20 25 13.4	2.961	7	5 55 21.00	2.1654	20 44 39.2	2.103
8	4 12 2.70	2.2133	20 28 7.9	2.855	8	5 57 30.86	2.1633	20 42 30.0	2.203
9	4 14 15.50	2.2134	20 30 56.0	2.748	9	5 59 40.59	2.1612	20 40 14.8	2.303
10	4 16 28.31	2.2134	20 33 37.7	2.641	10	6 1 50.20	2.1590	20 37 53.7	2.402
11	4 18 41.12	2.2134	20 36 12.9	2.534	11	6 3 59.68	2.1568	20 35 26.7	2.500
12	4 20 53.92	2.2133	20 38 41.7	2.427	12	6 6 9.02	2.1545	20 32 53.7	2.599
13	4 23 6.71	2.2133	20 41 4.1	2.320	13	6 8 18.22	2.1522	20 30 14.8	2.697
14	4 25 19.50	2.2130	20 43 20.1	2.214	14	6 10 27.29	2.1499	20 27 30.0	2.796
15	4 27 32.27	2.2128	20 45 29.7	2.107	15	6 12 36.22	2.1476	20 24 39.4	2.892
16	4 29 45.03	2.2125	20 47 32.9	2.000	16	6 14 45.01	2.1452	20 21 43.0	2.989
17	4 31 57.77	2.2122	20 49 29.6	1.892	17	6 16 53.65	2.1428	20 18 40.8	3.085
18	4 34 10.49	2.2118	20 51 19.9	1.785	18	6 19 2.15	2.1404	20 15 32.8	3.181
19	4 36 23.19	2.2114	20 53 3.8	1.678	19	6 21 10.50	2.1379	20 12 19.1	3.277
20	4 38 35.86	2.2109	20 54 41.2	1.571	20	6 23 18.70	2.1354	20 8 59.6	3.373
21	4 40 48.50	2.2104	20 56 12.2	1.463	21	6 25 26.75	2.1328	20 5 34.4	3.468
22	4 43 1.11	2.2098	20 57 36.7	1.356	22	6 27 34.64	2.1303	20 2 3.6	3.560
23	4 45 13.68	2.2092	20 58 54.8	1.248	23	6 29 42.38	2.1277	19 58 27.2	3.653
24	4 47 26.22	2.2086	N.21 0 6.5	1.141	24	6 31 49.96	2.1251	N.19 54 45.2	3.746

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 25.					SUNDAY 27.				
0	6 31 49.96	2.1261	N.19° 54' 45.2"	3.746	0	8 10 29.76	1.9639	N.15° 18' 46.5"	7.517
1	6 33 57.39	2.1224	19 50 57.7	3.838	1	8 12 28.71	1.9610	15 11 13.6	7.560
2	6 36 4.65	2.1197	19 47 4.6	3.930	2	8 14 27.48	1.9781	15 3 36.9	7.643
3	6 38 11.75	2.1170	19 43 6.0	4.022	3	8 16 26.08	1.9763	14 55 56.5	7.703
4	6 40 18.69	2.1143	19 39 2.0	4.113	4	8 18 24.52	1.9726	14 48 12.5	7.764
5	6 42 25.46	2.1116	19 34 52.6	4.203	5	8 20 22.78	1.9697	14 40 24.8	7.825
6	6 44 32.07	2.1087	19 30 37.7	4.293	6	8 22 20.88	1.9669	14 32 33.5	7.885
7	6 46 38.51	2.1059	19 26 17.5	4.383	7	8 24 18.81	1.9643	14 24 38.6	7.944
8	6 48 44.78	2.1031	19 21 51.9	4.470	8	8 26 16.58	1.9614	14 16 40.2	8.003
9	6 50 50.88	2.1003	19 17 21.0	4.556	9	8 28 14.18	1.9587	14 8 38.3	8.061
10	6 52 56.81	2.0975	19 12 44.9	4.646	10	8 30 11.62	1.9560	14 0 32.9	8.118
11	6 55 2.57	2.0946	19 8 3.5	4.733	11	8 32 8.90	1.9533	13 52 24.1	8.174
12	6 57 8.16	2.0917	19 3 16.9	4.819	12	8 34 6.01	1.9506	13 44 12.0	8.230
13	6 59 13.57	2.0888	18 58 25.2	4.906	13	8 36 2.96	1.9479	13 35 56.5	8.286
14	7 1 18.81	2.0859	18 53 28.3	4.990	14	8 37 59.76	1.9453	13 27 37.7	8.340
15	7 3 23.87	2.0829	18 48 26.3	5.076	15	8 39 56.40	1.9427	13 19 15.7	8.394
16	7 5 28.76	2.0800	18 43 19.3	5.159	16	8 41 52.89	1.9401	13 10 50.4	8.447
17	7 7 33.47	2.0770	18 38 7.2	5.242	17	8 43 49.22	1.9376	13 2 22.0	8.500
18	7 9 38.00	2.0740	18 32 50.2	5.326	18	8 45 45.40	1.9351	12 53 50.4	8.552
19	7 11 42.35	2.0710	18 27 28.3	5.407	19	8 47 41.43	1.9327	12 45 15.7	8.604
20	7 13 46.52	2.0681	18 22 1.4	5.488	20	8 49 37.32	1.9302	12 36 37.9	8.656
21	7 15 50.51	2.0651	18 16 29.7	5.569	21	8 51 33.06	1.9278	12 27 57.1	8.708
22	7 17 54.33	2.0621	18 10 53.1	5.650	22	8 53 28.65	1.9254	12 19 13.3	8.756
23	7 19 57.96	2.0590	N.18 5 11.7	5.730	23	8 55 24.10	1.9230	N.12 10 26.5	8.804
SATURDAY 26.					MONDAY 28.				
0	7 22 1.41	2.0560	N.17 59 25.5	5.809	0	8 57 19.41	1.9206	N.12 1 36.8	8.852
1	7 24 4.68	2.0529	17 53 34.6	5.897	1	8 59 14.58	1.9183	11 52 44.3	8.899
2	7 26 7.76	2.0499	17 47 39.0	5.986	2	9 1 9.61	1.9161	11 43 48.9	8.946
3	7 28 10.67	2.0469	17 41 38.8	6.042	3	9 3 4.51	1.9139	11 34 50.7	8.993
4	7 30 13.39	2.0439	17 35 33.9	6.119	4	9 4 59.28	1.9117	11 25 49.7	9.039
5	7 32 15.93	2.0409	17 29 24.5	6.196	5	9 6 53.91	1.9096	11 16 46.0	9.084
6	7 34 18.29	2.0378	17 23 10.5	6.270	6	9 8 48.42	1.9074	11 7 39.6	9.128
7	7 36 20.46	2.0347	17 16 52.0	6.346	7	9 10 42.80	1.9053	10 58 30.6	9.173
8	7 38 22.45	2.0317	17 10 29.1	6.419	8	9 12 37.06	1.9032	10 49 18.9	9.216
9	7 40 24.26	2.0286	17 4 1.7	6.493	9	9 14 31.20	1.9012	10 40 4.7	9.260
10	7 42 25.88	2.0256	16 57 29.9	6.566	10	9 16 25.21	1.8992	10 30 47.9	9.306
11	7 44 27.32	2.0226	16 50 53.8	6.637	11	9 18 19.10	1.8973	10 21 28.6	9.343
12	7 46 28.59	2.0196	16 44 13.4	6.709	12	9 20 12.88	1.8953	10 12 6.9	9.383
13	7 48 29.68	2.0166	16 37 28.7	6.780	13	9 22 6.55	1.8935	10 2 42.7	9.422
14	7 50 30.58	2.0136	16 30 39.8	6.850	14	9 24 0.10	1.8917	9 53 16.1	9.463
15	7 52 31.30	2.0106	16 23 46.7	6.920	15	9 25 53.55	1.8899	9 43 47.1	9.503
16	7 54 31.84	2.0075	16 16 49.4	6.989	16	9 27 46.89	1.8881	9 34 15.8	9.541
17	7 56 32.20	2.0046	16 9 48.0	7.057	17	9 29 40.13	1.8864	9 24 42.2	9.579
18	7 58 32.39	2.0016	16 2 42.6	7.124	18	9 31 33.26	1.8846	9 15 6.3	9.616
19	8 0 32.39	1.9986	15 55 33.1	7.191	19	9 33 26.30	1.8829	9 5 28.2	9.655
20	8 2 32.22	1.9956	15 48 19.6	7.257	20	9 35 19.24	1.8816	8 55 48.0	9.693
21	8 4 31.87	1.9927	15 41 2.2	7.323	21	9 37 12.09	1.8800	8 46 5.6	9.734
22	8 6 31.34	1.9897	15 33 40.8	7.388	22	9 39 4.84	1.8785	8 36 21.1	9.769
23	8 8 30.64	1.9869	15 26 15.6	7.453	23	9 40 57.50	1.8770	8 26 34.5	9.798
24	8 10 29.76	1.9839	N.15 18 46.5	7.517	24	9 42 50.08	1.8756	N. 8 16 45.9	9.837

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 29.					THURSDAY 31.				
0	9 42 50.08	1.8756	N. 8 16 45.9	9.827	0	11 12 8.94	1.8968	S. 0 2 54.0	10.773
1	9 44 42.58	1.8743	8 6 55.3	9.890	1	11 14 0.92	1.8969	0 13 40.6	10.779
2	9 46 34.99	1.8729	7 57 2.7	9.953	2	11 15 52.97	1.8981	0 24 27.5	10.784
3	9 48 27.32	1.8716	7 47 8.2	9.925	3	11 17 45.09	1.8993	0 35 14.7	10.789
4	9 50 19.58	1.8704	7 37 11.7	9.996	4	11 19 37.29	1.8706	0 46 2.1	10.793
5	9 52 11.76	1.8692	7 27 13.4	9.967	5	11 21 29.57	1.8720	0 56 49.8	10.798
6	9 54 3.88	1.8681	7 17 13.3	10.018	6	11 23 21.93	1.8735	1 7 37.6	10.798
7	9 55 55.93	1.8670	7 7 11.3	10.048	7	11 25 14.38	1.8750	1 18 25.6	10.800
8	9 57 47.92	1.8660	6 57 7.6	10.077	8	11 27 6.93	1.8766	1 29 13.6	10.801
9	9 59 39.85	1.8650	6 47 2.2	10.106	9	11 28 59.57	1.8782	1 40 1.7	10.802
10	10 1 31.72	1.8640	6 36 55.0	10.133	10	11 30 52.31	1.8798	1 50 49.9	10.802
11	10 3 23.53	1.8631	6 26 46.2	10.161	11	11 32 45.15	1.8815	2 1 38.0	10.801
12	10 5 15.29	1.8622	6 16 35.7	10.187	12	11 34 38.09	1.8833	2 12 26.1	10.800
13	10 7 7.00	1.8614	6 6 23.7	10.213	13	11 36 31.14	1.8851	2 23 14.1	10.799
14	10 8 58.66	1.8606	5 56 10.1	10.239	14	11 38 24.30	1.8870	2 34 2.0	10.797
15	10 10 50.28	1.8599	5 45 55.0	10.264	15	11 40 17.58	1.8890	2 44 49.8	10.795
16	10 12 41.85	1.8593	5 35 38.4	10.289	16	11 42 10.98	1.8910	2 55 37.4	10.792
17	10 14 33.39	1.8587	5 25 20.4	10.312	17	11 44 4.50	1.8931	3 6 24.8	10.788
18	10 16 24.89	1.8581	5 15 0.9	10.335	18	11 45 58.15	1.8952	3 17 11.9	10.783
19	10 18 16.36	1.8575	5 4 40.1	10.358	19	11 47 51.92	1.8973	3 27 58.7	10.777
20	10 20 7.79	1.8570	4 54 17.9	10.380	20	11 49 45.83	1.8995	3 38 45.1	10.771
21	10 21 59.20	1.8566	4 43 54.4	10.402	21	11 51 39.87	1.9019	3 49 31.2	10.765
22	10 23 50.58	1.8563	4 33 29.6	10.423	22	11 53 34.06	1.9043	4 0 16.9	10.767
23	10 25 41.94	1.8560	N. 4 23 3.6	10.444	23	11 55 28.39	1.9067	S. 4 11 2.1	10.749
WEDNESDAY 30.					FRIDAY, JANUARY 1, 1864.				
0	10 27 33.29	1.8556	N. 4 12 36.3	10.464	0	11 57 22.87	1.9092	S. 4 21 46.8	10.740
1	10 29 24.62	1.8554	4 2 7.9	10.483	PHASES OF THE MOON.				
2	10 31 15.94	1.8553	3 51 38.3	10.502					
3	10 33 7.26	1.8553	3 41 7.6	10.521					
4	10 34 58.57	1.8552	3 30 35.8	10.538					
5	10 36 49.88	1.8552	3 20 3.0	10.555	☾ Last Quarter, . . . 3 0 14.1 ● New Moon, . . . 10 8 23.5 ☽ First Quarter, . . . 16 23 45.7 ○ Full Moon, . . . 24 14 50.3				
6	10 38 41.19	1.8553	3 9 29.2	10.572					
7	10 40 32.51	1.8554	2 58 54.4	10.588					
8	10 42 23.84	1.8556	2 48 18.6	10.604					
9	10 44 15.18	1.8558	2 37 41.9	10.619	☾ Perigee, 12 5.5 ☾ Apogee, 28 2.4				
10	10 46 6.54	1.8561	2 27 4.4	10.633					
11	10 47 57.91	1.8564	2 16 26.0	10.647					
12	10 49 49.31	1.8566	2 5 46.8	10.660					
13	10 51 40.73	1.8572	1 55 6.9	10.672					
14	10 53 32.18	1.8577	1 44 26.2	10.684					
15	10 55 23.66	1.8583	1 33 44.8	10.696					
16	10 57 15.18	1.8589	1 23 2.7	10.707					
17	10 59 6.74	1.8596	1 12 20.0	10.717					
18	11 0 58.33	1.8603	1 1 36.7	10.727					
19	11 2 49.97	1.8610	0 50 52.8	10.736					
20	11 4 41.65	1.8618	0 40 8.4	10.745					
21	11 6 33.39	1.8627	0 29 23.5	10.753					
22	11 8 25.18	1.8637	0 18 38.1	10.760					
23	11 10 17.03	1.8647	N. 0 7 52.2	10.767					
24	11 12 8.94	1.8658	S. 0 2 54.0	10.773					

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	Aldebaran W.	68° 39' 3	3093	70° 7' 21	3092	71° 35' 40	3090	73° 4' 2	3087
	Saturn E.	58 53 3	3143	57 25 46	3143	55 58 27	3141	54 31 7	3139
	Spica E.	64 58 40	3080	63 30 6	3078	62 1 29	3076	60 32 49	3073
	Venus E.	65 43 9	3466	64 22 7	3466	63 1 5	3466	61 40 2	3463
	Jupiter E.	87 39 20	3166	86 12 21	3166	84 45 21	3165	83 18 18	3163
	Mars E.	92 22 42	3336	90 59 15	3337	89 35 46	3335	88 12 15	3333
	SUN E.	111 51 59	3467	110 30 58	3466	109 9 55	3463	107 48 50	3461
2	Aldebaran W.	80 26 56	3066	81 55 47	3061	83 24 44	3055	84 53 49	3048
	Pollux W.	39 13 17	3250	40 38 27	3233	42 3 57	3216	43 29 47	3201
	Saturn E.	47 13 54	3126	45 46 18	3126	44 18 39	3121	42 50 55	3117
	Spica E.	53 8 34	3053	51 39 27	3048	50 10 14	3043	48 40 54	3036
	Venus E.	54 54 7	3448	53 32 45	3443	52 11 17	3438	50 49 44	3433
	Jupiter E.	76 2 4	3182	74 34 33	3127	73 6 56	3121	71 39 12	3114
	Mars E.	81 13 44	3312	79 49 46	3306	78 25 41	3300	77 1 29	3293
	SUN E.	101 2 26	3439	99 40 54	3433	98 19 15	3427	96 57 29	3420
3	Aldebaran W.	92 21 25	3009	93 51 26	3000	95 21 39	2990	96 52 4	2981
	Pollux W.	50 43 27	3127	52 11 4	3112	53 38 59	3096	55 7 11	3083
	Spica E.	41 12 3	2997	39 41 47	2989	38 11 20	2979	36 40 41	2969
	Venus E.	44 0 15	3400	42 37 58	3392	41 15 33	3384	39 52 58	3376
	Jupiter E.	64 18 21	3075	62 49 41	3066	61 20 49	3066	59 51 45	3046
	Mars E.	69 58 19	3252	68 33 11	3242	67 7 51	3231	65 42 19	3220
	SUN E.	90 6 29	3378	88 43 47	3366	87 20 54	3367	85 57 48	3346
4	Aldebaran W.	104 27 27	2924	105 59 16	2911	107 31 21	2896	109 3 42	2886
	Pollux W.	62 32 42	3009	64 2 44	2993	65 33 5	2978	67 3 45	2962
	Regulus W.	25 31 17	3023	27 1 1	2999	28 31 15	2976	30 1 58	2954
	Venus E.	32 57 38	3333	31 34 4	3294	30 10 20	3216	28 46 27	3206
	Jupiter E.	52 23 3	2987	50 52 34	2975	49 21 50	2962	47 50 49	2946
	Mars E.	58 31 17	3160	57 4 20	3147	55 37 7	3133	54 9 37	3116
	SUN E.	78 58 58	3284	77 34 28	3270	76 9 41	3266	74 44 38	3241
5	Pollux W.	74 42 8	2981	76 14 51	2964	77 47 56	2947	79 21 23	2931
	Regulus W.	37 42 11	2983	39 15 30	2954	40 49 14	2916	42 23 23	2796
	Jupiter E.	40 11 16	2974	38 38 24	2959	37 5 13	2944	35 31 42	2926
	Mars E.	46 47 34	3041	45 18 12	3034	43 48 29	3008	42 18 26	2996
	SUN E.	67 34 50	3163	66 7 55	3146	64 40 40	3128	63 13 4	3110
6	Pollux W.	87 14 10	2744	88 49 52	2736	90 25 57	2708	92 2 26	2691
	Regulus W.	50 20 22	2760	51 57 2	2691	53 34 7	2663	55 11 37	2643
	Mars E.	34 42 42	2901	33 10 25	2883	31 37 45	2866	30 4 41	2846
	SUN E.	55 49 38	3019	54 19 49	3001	52 49 37	2981	51 19 1	2963
7	Pollux W.	100 10 40	2606	101 49 28	2608	103 28 40	2571	105 8 15	2556
	Regulus W.	63 25 34	2549	65 5 39	2531	66 46 9	2513	68 27 5	2494
	SUN E.	43 40 3	2668	42 7 3	2646	40 33 38	2630	38 59 49	2611
12	SUN W.	22 59 40	2266	24 43 17	2207	26 26 56	2207	28 10 35	2206
	α Perseus E.	68 50 27	2244	67 3 5	2230	65 15 52	2206	63 28 48	2203
	α Arietis E.	111 55 22	2126	110 5 3	2126	108 14 43	2126	106 24 22	2126
13	SUN W.	36 48 17	2412	38 31 35	2416	40 14 47	2423	41 57 51	2426
	α Pegasi E.	54 36 47	2321	52 51 18	2337	51 6 12	2356	49 21 32	2376
	α Arietis E.	97 13 14	2140	95 23 16	2144	93 33 24	2149	91 43 40	2156

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Aldebaran W.	74° 32' 28"	3083	76° 0' 58"	3088	77° 29' 32"	3076	78° 58' 11"	3071
	Saturn E.	53 3 45	3138	51 36 21	3136	50 8 55	3133	48 41 26	3131
	Spica E.	59 4 6	3070	57 35 20	3066	56 6 29	3063	54 37 34	3060
	Venus E.	60 18 57	3461	58 57 49	3460	57 36 39	3466	56 15 25	3463
	Jupiter E.	81 51 12	3149	80 24 2	3146	78 56 48	3163	77 29 29	3157
	Mars E.	86 48 42	3330	85 25 5	3335	84 1 23	3321	82 37 36	3317
	SUN E.	106 27 42	3487	105 6 30	3484	103 45 14	3449	102 23 53	3444
2	Aldebaran W.	86 23 2	3043	87 52 23	3064	89 21 54	3028	90 51 34	3018
	Pollux W.	44 55 55	3186	46 22 22	3171	47 49 6	3166	49 16 8	3142
	Saturn E.	41 23 6	3113	39 55 12	3110	38 27 14	3105	36 59 11	3101
	Spica E.	47 11 26	3030	45 41 50	3022	44 12 4	3014	42 42 9	3006
	Venus E.	49 28 4	3436	48 6 17	3421	46 44 24	3414	45 22 23	3408
	Jupiter E.	70 11 20	3108	68 43 20	3100	67 15 10	3093	65 46 51	3083
	Mars E.	75 37 9	3286	74 12 40	3278	72 48 3	3270	71 23 16	3261
	SUN E.	95 35 35	3413	94 13 32	3406	92 51 21	3396	91 29 0	3397
3	Aldebaran W.	98 22 41	2970	99 53 31	2960	101 24 35	2948	102 55 53	2936
	Pollux W.	56 35 41	3069	58 4 29	3064	59 33 35	3059	61 2 59	3054
	Spica E.	35 9 49	2968	33 38 44	2947	32 7 25	2936	30 35 52	2924
	Venus E.	38 30 14	3367	37 7 20	3360	35 44 16	3350	34 21 2	3341
	Jupiter E.	58 22 28	3034	56 52 58	3023	55 23 14	3012	53 53 16	3000
	Mars E.	64 16 34	3209	62 50 36	3198	61 24 24	3188	59 57 58	3178
	SUN E.	84 34 30	3334	83 10 58	3323	81 47 13	3310	80 23 13	3297
4	Aldebaran W.	110 36 20	2973	112 9 15	2967	113 42 29	2943	115 16 2	2936
	Pollux W.	68 34 45	2946	70 6 5	2961	71 37 45	2914	73 9 46	2908
	Regulus W.	31 33 9	2933	33 4 46	2913	34 36 49	2903	36 9 17	2873
	Venus E.	27 22 25	3361	25 58 15	3296	24 38 59	3291	23 9 37	3287
	Jupiter E.	46 19 31	2984	44 47 55	2930	43 16 1	2906	41 43 48	2890
	Mars E.	52 41 49	3163	51 13 43	3098	49 45 19	3073	48 16 36	3067
	SUN E.	73 19 17	3326	71 53 38	3210	70 27 41	3194	69 1 25	3178
5	Pollux W.	80 55 11	2813	82 29 22	2796	84 3 55	2779	85 38 51	2761
	Regulus W.	43 57 57	2776	45 32 56	2758	47 8 19	2738	48 44 8	2719
	Jupiter E.	33 57 51	2818	32 23 41	2801	30 49 15	2791	29 14 35	2782
	Mars E.	40 48 1	2973	39 17 14	2966	37 46 6	2938	36 14 35	2920
	SUN E.	61 45 7	3093	60 16 48	3074	58 48 7	3056	57 19 4	3038
6	Pollux W.	93 39 18	2674	95 16 33	2656	96 54 12	2639	98 32 14	2621
	Regulus W.	56 49 33	2694	58 27 55	2668	60 6 42	2667	61 45 55	2666
	Mars E.	28 31 13	2936	26 57 21	2908	25 23 4	2790	23 48 23	2773
	SUN E.	49 48 2	2944	48 16 39	2934	46 44 51	2906	45 12 39	2887
7	Pollux W.	106 48 12	2538	108 28 32	2523	110 9 13	2508	111 50 15	2498
	Regulus W.	70 8 27	2476	71 50 14	2456	73 32 26	2440	75 15 4	2423
	SUN E.	37 25 35	2793	35 50 57	2774	34 15 55	2766	32 40 30	2756
12	SUN W.	29 54 13	2360	31 37 49	2401	33 21 23	2403	35 4 53	2408
	α Pegasi E.	61 41 54	2373	59 55 13	2383	58 8 47	2294	56 22 38	2306
	α Arietis E.	104 34 2	2137	102 43 44	2139	100 53 29	2132	99 3 19	2136
13	SUN W.	43 40 46	2436	45 23 31	2443	47 6 6	2450	48 48 30	2458
	α Pegasi E.	47 37 21	2397	45 53 42	2433	44 10 38	2450	42 28 14	2480
	α Arietis E.	89 54 5	2163	88 4 40	2160	86 15 25	2176	84 26 21	2184

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	III ^h .	P. L. of Diff.	VI ^h .	P. L. of Diff.	IX ^h .	P. L. of Diff.
14	SUN W.	50° 30' 43"	2466	52° 12' 44"	2476	53° 54' 32"	2486	55° 36' 6"	2494
	α Arietis E.	82 37 30	2198	80 48 52	2202	79 0 27	2212	77 12 17	2221
	Aldebaran E.	115 48 41	2167	113 59 23	2174	112 10 16	2182	110 21 22	2192
15	SUN W.	64 0 21	2549	65 40 26	2561	67 20 14	2573	68 59 46	2586
	α Arietis E.	68 15 18	2277	66 28 45	2289	64 42 30	2292	62 56 34	2315
	Aldebaran E.	101 20 26	2243	99 33 1	2252	97 45 51	2263	95 58 57	2274
16	SUN W.	77 13 13	2649	78 51 2	2661	80 28 34	2675	82 5 48	2688
	α Arietis E.	54 11 46	2386	52 27 51	2401	50 44 17	2416	49 1 5	2433
	Aldebaran E.	87 8 41	2333	85 23 30	2345	83 38 36	2367	81 54 0	2369
17	SUN W.	90 7 35	2753	91 43 4	2766	93 18 16	2779	94 53 11	2793
	α Aquilæ W.	57 46 28	3009	59 16 29	3001	60 46 40	3094	62 17 0	3089
	Aldebaran E.	73 15 24	2431	71 32 34	2443	69 50 1	2456	68 7 46	2466
	Pollux E.	115 13 37	2613	113 32 40	2623	111 51 57	2632	110 11 28	2641
18	SUN W.	102 43 30	2897	104 16 44	2909	105 49 42	2922	107 22 24	2934
	α Aquilæ W.	69 49 42	2984	71 20 15	2986	72 50 46	2999	74 21 12	2993
	Aldebaran E.	59 40 50	2630	58 0 18	2643	56 20 3	2654	54 40 5	2666
	Pollux E.	101 52 31	2698	100 13 27	2704	98 34 37	2715	96 56 2	2726
19	SUN W.	115 2 3	2964	116 33 13	2965	118 4 9	2977	119 34 50	2989
	α Aquilæ W.	81 51 55	3023	83 21 40	3030	84 51 15	3039	86 20 40	3047
	Fomalhaut W.	54 48 48	2843	56 12 10	2826	57 35 53	2810	58 59 53	2797
	Aldebaran E.	46 24 22	2626	44 46 3	2638	43 8 0	2649	41 30 14	2663
	Pollux E.	88 46 43	2678	87 9 34	2689	85 32 40	2700	83 56 0	2711
20	α Aquilæ W.	93 44 53	3008	95 13 5	3110	96 41 2	3122	98 8 45	3136
	Fomalhaut W.	66 3 1	2866	67 28 4	2833	68 53 11	2850	70 18 21	2847
	α Pegasi W.	46 7 2	2967	47 38 9	2963	49 9 21	2960	50 40 37	2947
	Aldebaran E.	33 25 33	2727	31 49 29	2741	30 13 44	2756	28 38 18	2772
	Pollux E.	75 56 16	2765	74 21 2	2775	72 46 2	2786	71 11 16	2796
	Regulus E.	112 38 10	2706	111 1 37	2714	109 25 16	2723	107 49 7	2732
21	Fomalhaut W.	77 24 24	2862	78 49 32	2855	80 14 36	2850	81 39 36	2863
	α Pegasi W.	58 17 14	2980	59 48 30	2992	61 19 43	2996	62 50 52	2996
	Pollux E.	63 21 3	2663	61 47 44	2666	60 14 40	2676	58 41 51	2686
	Regulus E.	99 51 13	2775	98 16 12	2783	96 41 22	2792	95 6 43	2799
22	Fomalhaut W.	88 43 5	2894	90 7 24	2901	91 31 34	2910	92 55 34	2919
	α Pegasi W.	70 25 29	2979	71 56 8	2984	73 26 41	2999	74 57 7	2994
	α Arietis W.	26 49 14	3023	28 18 58	3013	29 48 56	3003	31 19 5	2996
	Pollux E.	51 1 42	2963	49 30 30	2967	47 59 36	2961	46 29 0	2967
	Regulus E.	87 16 6	2826	85 42 29	2848	84 9 3	2855	82 35 47	2863
23	Fomalhaut W.	99 52 49	2972	101 15 38	2986	102 38 12	2998	104 0 31	3011
	α Pegasi W.	82 27 34	3024	83 57 17	3030	85 26 52	3037	86 56 19	3044
	α Arietis W.	38 51 18	2965	40 21 50	2965	41 52 22	2916	43 22 52	2969
	Regulus E.	74 51 56	2901	73 19 39	2909	71 47 31	2916	70 15 33	2924
	Saturn E.	123 56 7	2981	122 24 28	2987	120 52 56	2943	119 21 32	2949
24	α Pegasi W.	94 21 27	3078	95 50 3	3087	97 18 29	3094	98 46 46	3101
	α Arietis W.	50 54 35	3004	52 24 43	3007	53 54 47	3011	55 24 46	3015
	Regulus E.	62 38 6	2961	61 7 4	2969	59 36 12	2976	58 5 29	2983

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
14	SUN W.	57° 17' 27"	2606	58° 58' 33"	2616	60° 39' 24"	2627	62° 20' 0"	2638
	α Arietis E.	75 24 21	2292	73 36 41	2243	71 49 17	2263	70 2 9	2266
	Aldebaran E.	108 32 42	2201	106 44 16	2210	104 56 4	2220	103 8 7	2231
15	SUN W.	70 39 2	2697	72 18 1	2610	73 56 42	2623	75 35 6	2635
	α Arietis E.	61 10 56	2298	59 25 38	2243	57 40 40	2267	55 56 3	2271
	Aldebaran E.	94 12 20	2298	92 26 0	2297	90 39 56	2299	88 54 10	2321
16	SUN W.	83 42 44	2701	85 19 23	2714	86 55 44	2727	88 31 48	2740
	α Arietis E.	47 18 17	2460	45 35 53	2466	43 53 52	2484	42 12 16	2493
	Aldebaran E.	80 9 41	2262	78 25 40	2294	76 41 57	2407	74 58 32	2419
17	SUN W.	96 27 48	2606	98 2 8	2618	99 36 12	2631	101 9 59	2644
	α Aquilæ W.	63 47 27	2666	65 17 58	2663	66 48 32	2682	68 19 7	2692
	Aldebaran E.	66 25 48	2481	64 44 8	2483	63 2 45	2606	61 21 39	2617
	Pollux E.	108 31 12	2661	106 51 10	2692	105 11 23	2672	103 31 50	2663
18	SUN W.	108 54 51	2606	110 27 2	2619	111 58 57	2631	113 30 37	2643
	α Aquilæ W.	75 51 34	2697	77 21 50	2608	78 51 59	2609	80 22 1	2616
	Aldebaran E.	53 0 23	2678	51 20 58	2691	49 41 50	2692	48 2 58	2614
	Pollux E.	95 17 41	2636	93 39 35	2646	92 1 43	2667	90 24 6	2666
19	SUN W.	121 5 17	3000	122 35 30	3011	124 5 29	3022	125 35 14	3033
	α Aquilæ W.	87 49 55	3046	89 18 58	3066	90 47 49	3076	92 16 28	3087
	Fomalhaut W.	60 24 8	2286	61 48 36	2276	63 13 16	2268	64 38 5	2262
	Aldebaran E.	39 52 44	2676	38 15 31	2687	36 38 34	2701	35 1 55	2713
	Pollux E.	82 19 35	2723	80 43 24	2733	79 7 27	2743	77 31 44	2754
20	α Aquilæ W.	99 36 12	3148	101 3 23	3162	102 30 18	3176	103 56 56	3191
	Fomalhaut W.	71 43 34	2247	73 8 48	2247	74 34 1	2248	75 59 13	2249
	α Pegasi W.	52 11 56	2946	53 43 16	2946	55 14 36	2946	56 45 56	2948
	Aldebaran E.	27 3 13	2788	25 28 29	2806	23 54 9	2826	22 20 14	2846
	Pollux E.	69 36 45	2808	68 2 28	2819	66 28 25	2831	64 54 37	2843
	Regulus E.	106 13 9	2741	104 37 23	2749	103 1 48	2769	101 26 25	2766
21	Fomalhaut W.	83 4 31	2268	84 29 20	2274	85 54 2	2280	87 18 37	2286
	α Pegasi W.	64 21 57	2992	65 52 57	2966	67 23 53	2969	68 54 44	2974
	Pollux E.	57 9 17	2901	55 36 59	2913	54 4 57	2926	52 33 11	2939
	Regulus E.	93 32 14	2808	91 57 56	2816	90 23 49	2824	88 49 52	2833
22	Fomalhaut W.	94 19 24	2228	95 43 3	2228	97 6 31	2248	98 29 47	2260
	α Pegasi W.	76 27 27	3000	77 57 40	3006	79 27 45	3012	80 57 43	3018
	α Arietis W.	32 49 23	2991	34 19 47	2998	35 50 15	2993	37 20 46	2986
	Pollux E.	44 58 44	3014	43 28 48	3031	41 59 14	3049	40 30 2	3066
	Regulus E.	81 2 41	2671	79 29 45	2679	77 56 59	2687	76 24 23	2694
23	Fomalhaut W.	105 22 35	2426	106 44 23	2441	108 5 53	2457	109 27 5	2473
	α Pegasi W.	88 25 37	3061	89 54 47	3067	91 23 49	3063	92 52 42	3071
	α Arietis W.	44 53 19	2990	46 23 44	2993	47 54 5	2997	49 24 22	3000
	Regulus E.	68 43 45	2931	67 12 6	2939	65 40 37	2946	64 9 17	2954
	Saturn E.	117 50 15	2966	116 19 6	2993	114 48 5	2996	113 17 12	2973
24	α Pegasi W.	100 14 54	3110	101 42 52	3117	103 10 41	3126	104 38 20	3133
	α Arietis W.	56 54 40	3019	58 24 29	3024	59 54 12	3028	61 23 50	3033
	Regulus E.	56 34 55	2990	55 4 30	2996	53 34 15	3006	52 4 9	3013

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
24	Saturn E.	111° 46' 26"	2980	110° 15' 48"	2984	108° 45' 18"	2992	107° 14' 55"	2997
	Spica E.	116 26 41	2985	114 55 7	2941	113 23 40	2947	111 52 21	2944
25	α Arietis W.	62 53 22	3037	64 22 49	3042	65 52 10	3047	67 21 25	3051
	Aldebaran W.	29 34 53	3038	31 4 19	3039	32 33 44	3041	34 3 6	3043
	Regulus E.	50 34 12	3090	49 4 24	3038	47 34 46	3036	46 5 17	3043
	Saturn E.	99 44 49	3026	98 15 9	3033	96 45 37	3038	95 16 11	3043
	Spica E.	104 17 47	2985	102 47 15	2990	101 16 50	2996	99 46 32	3002
26	α Arietis W.	74 46 20	3073	76 15 3	3077	77 43 41	3081	79 12 14	3085
	Aldebaran W.	41 29 12	3067	42 58 14	3060	44 27 13	3064	45 56 7	3068
	Regulus E.	38 40 15	3083	37 11 45	3081	35 43 25	3101	34 15 16	3110
	Saturn E.	87 50 40	3069	86 21 52	3073	84 53 10	3078	83 24 34	3082
	Spica E.	92 16 46	3028	90 47 8	3033	89 17 35	3037	87 48 8	3041
	Venus E.	118 54 27	3454	117 33 12	3461	116 12 4	3467	114 51 3	3473
	Jupiter E.	119 53 9	3097	118 24 56	3101	116 56 48	3106	115 28 46	3110
27	α Arietis W.	86 33 48	3103	88 1 54	3106	89 29 56	3109	90 57 55	3112
	Aldebaran W.	53 19 46	3080	54 48 20	3083	56 16 50	3086	57 45 18	3087
	Saturn E.	76 2 52	3103	74 34 46	3106	73 6 44	3110	71 38 46	3112
	Spica E.	80 22 10	3080	78 53 12	3084	77 24 18	3087	75 55 28	3089
	Venus E.	108 7 22	3495	106 46 52	3499	105 26 27	3502	104 6 5	3506
	Jupiter E.	108 9 50	3129	106 42 16	3133	105 14 46	3135	103 47 19	3138
28	α Arietis W.	98 17 2	3123	99 44 44	3124	101 12 24	3126	102 40 2	3127
	Aldebaran W.	65 7 2	3096	66 35 18	3096	68 3 33	3096	69 31 47	3096
	Saturn E.	64 19 46	3124	62 52 6	3127	61 24 29	3129	59 56 54	3129
	Spica E.	68 32 1	3079	67 3 26	3081	65 34 53	3082	64 6 21	3082
	Jupiter E.	96 30 49	3148	95 3 37	3149	93 36 27	3149	92 9 17	3150
	Venus E.	97 25 1	3516	96 4 55	3517	94 44 50	3518	93 24 46	3518
	Mars E.	114 41 31	3346	113 18 13	3347	111 54 56	3349	110 31 41	3349
29	Aldebaran W.	76 53 2	3093	78 21 20	3091	79 49 41	3089	81 18 4	3087
	Pollux W.	35 46 25	3308	37 10 27	3292	38 34 48	3277	39 59 26	3263
	Saturn E.	52 39 15	3133	51 11 45	3132	49 44 14	3132	48 16 43	3132
	Spica E.	56 43 43	3079	55 15 8	3078	53 46 32	3077	52 17 54	3074
	Jupiter E.	84 53 30	3148	83 26 18	3146	81 59 4	3143	80 31 47	3142
	Venus E.	86 44 28	3516	85 24 22	3516	84 4 15	3513	82 44 5	3511
	Mars E.	103 35 25	3346	102 12 7	3345	100 48 48	3343	99 25 26	3341
	SUN E.	131 57 24	3481	130 36 39	3480	129 15 53	3478	127 55 4	3476
30	Aldebaran W.	88 40 48	3076	90 9 34	3065	91 38 26	3060	93 7 24	3055
	Pollux W.	47 6 31	3292	48 32 38	3190	49 58 59	3180	51 25 32	3090
	Saturn E.	40 58 55	3136	39 31 17	3126	38 3 38	3124	36 35 57	3122
	Jupiter E.	73 14 35	3134	71 46 55	3119	70 19 9	3114	68 51 16	3109
	Venus E.	76 2 28	3492	74 41 55	3488	73 21 17	3482	72 0 33	3477
	Mars E.	92 27 50	3334	91 4 6	3319	89 40 16	3313	88 16 20	3307
	SUN E.	121 10 7	3455	119 48 53	3451	118 27 34	3445	117 6 8	3438
31	Aldebaran W.	100 34 5	3023	102 3 51	3014	103 33 46	3006	105 3 52	2997
	Pollux W.	58 41 32	3114	60 9 24	3104	61 37 29	3092	63 5 48	3080
	Jupiter E.	61 30 4	3075	60 1 24	3066	58 32 33	3066	57 3 32	3048
	Venus E.	65 15 6	3440	63 53 35	3431	62 31 54	3423	61 10 3	3413
	Mars E.	81 14 49	3272	79 50 5	3264	78 25 11	3255	77 0 7	3246
	SUN E.	110 17 6	3492	108 54 52	3398	107 32 27	3384	106 9 52	3374

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
24	Saturn E.	105° 44' 39"	3004	104° 14' 31"	3009	102° 44' 36"	3015	101° 14' 36"	3021
	Spica E.	110 21 11	3061	108 50 9	3066	107 19 14	3073	105 48 27	3078
25	α Arietis W.	68 50 35	3065	70 19 39	3080	71 48 38	3084	73 17 32	3089
	Aldebaran W.	35 32 26	3045	37 1 43	3048	38 30 56	3051	40 0 6	3054
	Regulus E.	44 35 57	3061	43 6 47	3066	41 37 46	3068	40 8 55	3073
	Saturn E.	93 46 52	3048	92 17 39	3064	90 48 33	3069	89 19 33	3065
	Spica E.	98 16 22	3007	96 46 18	3013	95 16 21	3018	93 46 30	3023
26	α Arietis W.	80 40 42	3089	82 9 5	3092	83 37 24	3096	85 5 38	3100
	Aldebaran W.	47 24 58	3069	48 53 45	3072	50 22 29	3076	51 51 9	3078
	Regulus E.	32 47 19	3120	31 19 34	3131	29 52 2	3143	28 24 44	3156
	Saturn E.	81 56 3	3087	80 27 38	3091	78 59 18	3096	77 31 3	3099
	Spica E.	86 18 46	3046	84 49 30	3080	83 20 19	3043	81 51 12	3067
	Venus E.	113 30 8	3478	112 9 19	3482	110 48 35	3487	109 27 56	3491
	Jupiter E.	114 0 49	3114	112 32 57	3119	111 5 10	3123	109 37 28	3136
27	α Arietis W.	92 25 50	3114	93 53 42	3117	95 21 31	3119	96 49 18	3121
	Aldebaran W.	59.13 43	3090	60 42 5	3091	62 10 26	3092	63 38 45	3094
	Saturn E.	70 10 51	3116	68 43 0	3119	67 15 13	3120	65 47 28	3123
	Spica E.	74 26 41	3072	72 57 57	3074	71 29 16	3076	70 0 37	3078
	Venus E.	102 45 47	3506	101 25 32	3510	100 5 19	3513	98 45 9	3515
	Jupiter E.	102 19 56	3141	100 52 36	3143	99 25 18	3144	97 58 2	3147
28	α Arietis W.	104 7 39	3128	105 35 15	3129	107 2 50	3129	108 30 25	3129
	Aldebaran W.	71 0 1	3095	72 28 15	3097	73 56 30	3097	75 24 45	3094
	Saturn E.	58 29 20	3130	57 1 47	3132	55 34 16	3132	54 6 45	3133
	Spica E.	62 37 50	3082	61 9 19	3082	59 40 48	3082	58 12 16	3081
	Jupiter E.	90 42 8	3150	89 14 59	3150	87 47 50	3150	86 20 41	3148
	Venus E.	92 4 42	3519	90 44 39	3519	89 24 36	3518	88 4 32	3518
	Mars E.	109 8 26	3360	107 45 12	3349	106 21 57	3349	104 58 41	3348
29	Aldebaran W.	82 46 29	3084	84 14 58	3092	85 43 30	3078	87 12 7	3074
	Pollux W.	41 24 21	3260	42 49 31	3286	44 14 57	3226	45 40 37	3213
	Saturn E.	46 49 12	3131	45 21 40	3129	43 54 6	3129	42 26 31	3128
	Spica E.	50 49 13	3072	49 20 29	3090	47 51 42	3066	46 22 51	3061
	Jupiter E.	79 4 28	3136	77 37 6	3136	76 9 40	3138	74 42 10	3129
	Venus E.	81 23 53	3506	80 3 38	3506	78 43 19	3501	77 22 56	3497
	Mars E.	98 2 2	3368	96 38 35	3385	95 15 4	3352	93 51 29	3328
	Sun E.	126 34 13	3472	125 13 18	3469	123 52 19	3464	122 31 15	3461
30	Aldebaran W.	94 36 29	3049	96 5 41	3043	97 35 1	3036	99 4 29	3030
	Pollux W.	52 52 18	3166	54 19 17	3148	55 46 29	3137	57 13 54	3126
	Saturn E.	35 8 14	3121	33 40 30	3120	32 12 45	3119	30 44 59	3120
	Jupiter E.	67 23 17	3163	65 55 11	3096	64 26 57	3090	62 58 35	3082
	Venus E.	70 39 43	3471	69 18 46	3463	67 57 41	3466	66 36 28	3448
	Mars E.	86 52 17	3301	85 28 7	3294	84 3 49	3288	82 39 23	3281
	Sun E.	115 44 35	3422	114 22 55	3426	113 1 7	3418	111 39 11	3410
31	Aldebaran W.	106 34 9	3067	108 4 38	3078	109 35 18	3069	111 6 10	3068
	Pollux W.	64 34 22	3099	66 3 10	3056	67 32 13	3046	69 1 30	3033
	Jupiter E.	55 34 19	3039	54 4 54	3030	52 35 18	3019	51 5 20	3009
	Venus E.	59 48 1	3403	58 25 48	3393	57 3 23	3381	55 40 45	3369
	Mars E.	75 34 52	3236	74 9 26	3225	72 43 47	3214	71 17 55	3203
	Sun E.	104 47 6	3264	103 24 8	3252	102 0 58	3242	100 37 35	3230

GREENWICH MEAN TIME.

JANUARY.										FEBRUARY.											
Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.		
	Noon.				Noon.						Noon.				Noon.						
	h	m	s	s	°	'	"	"	h	m		h	m	s	s	°	'	"	"	h	m
1	19	9	6.59	13.643	23	23	34.7	17.48	0 26.6	1	21	50	10.69	12.201	14	41	9.9	62.43	1	5.4	
2	19	14	33.73	13.617	23	16	13.5	19.27	0 28.1	2	21	55	2.92	12.161	14	15	58.7	63.44	1	6.3	
3	19	20	0.20	13.588	23	8	9.4	21.06	0 29.5	3	21	59	53.95	12.102	13	50	24.4	64.40	1	7.2	
4	19	25	25.95	13.567	22	59	22.6	22.83	0 30.9	4	22	4	43.80	12.063	13	24	27.7	65.30	1	8.1	
5	19	30	50.93	13.538	22	49	53.5	24.58	0 32.4	5	22	9	32.49	12.005	12	58	9.4	66.18	1	9.0	
6	19	36	15.08	13.489	22	39	42.7	26.31	0 33.9	6	22	14	20.04	11.959	12	31	30.3	67.04	1	9.8	
7	19	41	38.36	13.451	22	28	50.5	28.03	0 35.4	7	22	19	6.50	11.914	12	4	31.3	67.86	1	10.6	
8	19	47	0.73	13.412	22	17	17.3	29.73	0 36.8	8	22	23	51.91	11.871	11	37	13.1	68.64	1	11.4	
9	19	52	22.14	13.372	22	5	3.5	31.41	0 38.2	9	22	28	36.29	11.828	11	9	36.3	69.40	1	12.2	
10	19	57	42.56	13.329	21	52	9.7	33.06	0 39.6	10	22	33	19.65	11.786	10	41	41.9	70.12	1	13.1	
11	20	3	1.96	13.286	21	38	36.5	34.69	0 41.0	11	22	38	2.02	11.745	10	13	30.7	70.81	1	13.9	
12	20	8	20.29	13.241	21	24	24.5	36.30	0 42.4	12	22	42	43.44	11.707	9	45	3.3	71.46	1	14.6	
13	20	13	37.51	13.194	21	9	34.1	37.89	0 43.8	13	22	47	23.95	11.670	9	16	20.5	72.08	1	15.3	
14	20	18	53.60	13.146	20	54	5.9	39.45	0 45.1	14	22	52	3.59	11.634	8	47	23.1	72.69	1	16.0	
15	20	24	8.54	13.097	20	38	0.6	40.98	0 46.4	15	22	56	42.39	11.597	8	18	11.9	73.24	1	16.7	
16	20	29	22.29	13.048	20	21	18.8	43.49	0 47.7	16	23	1	20.37	11.556	7	48	47.7	73.76	1	17.3	
17	20	34	34.85	12.999	20	4	1.2	45.97	0 49.0	17	23	5	57.58	11.516	7	19	11.3	74.26	1	17.9	
18	20	39	46.19	12.947	19	46	8.4	48.41	0 50.2	18	23	10	34.05	11.506	6	49	23.4	74.72	1	18.7	
19	20	44	56.30	12.895	19	27	41.4	49.82	0 51.4	19	23	15	9.82	11.477	6	19	24.8	75.15	1	19.3	
20	20	50	5.15	12.842	19	8	40.8	49.21	0 52.6	20	23	19	44.93	11.450	5	49	16.3	75.54	1	20.1	
21	20	55	12.71	12.788	18	49	7.1	49.58	0 53.8	21	23	24	19.42	11.424	5	18	58.6	76.01	1	20.7	
22	21	0	18.97	12.734	18	29	1.0	50.91	0 55.0	22	23	28	53.30	11.400	4	48	32.6	76.34	1	21.3	
23	21	5	23.93	12.679	18	8	23.2	52.21	0 56.1	23	23	33	26.62	11.377	4	17	59.2	76.53	1	21.9	
24	21	10	27.60	12.626	17	47	14.7	53.48	0 57.2	24	23	37	59.43	11.356	3	47	18.9	76.81	1	22.6	
25	21	15	29.98	12.573	17	25	36.1	54.72	0 58.3	25	23	42	31.75	11.337	3	16	32.4	77.05	1	23.2	
26	21	20	31.08	12.519	17	3	28.2	55.92	0 59.4	26	23	47	3.64	11.321	2	45	40.5	77.26	1	23.8	
27	21	25	30.89	12.466	16	40	51.9	57.09	1 0.5	27	23	51	35.15	11.306	2	14	44.0	77.43	1	24.3	
28	21	30	29.39	12.411	16	17	47.9	58.23	1 1.5	28	23	56	6.31	11.292	1	43	43.8	77.57	1	24.9	
29	21	35	26.60	12.356	15	54	16.9	59.33	1 2.5	29	0	0	37.17	11.281	1	12	40.5	77.69	1	25.4	
30	21	40	22.55	12.305	15	30	19.8	60.41	1 3.5	30	0	5	7.77	11.270	0	41	34.9	77.77	1	26.0	
31	21	45	17.24	12.253	15	5	57.2	61.45	1 4.5	31	0	9	38.14	11.262	0	10	27.6	77.83	1	26.6	
32	21	50	10.69	12.201	14	41	9.9	62.43	1 5.4	32	0	14	8.33	11.256	0	20	40.7	77.86	1	27.1	
Day of Month, 1st.										Day of the Month, 5th.											
Semidiam. 5.0										Semidiameter 5.2											
Hor. Par. 5.0										Hor. Parallax 5.2											
6th.	5.0	5.0	5.0	5.1	5.1	5.1	5.1	5.1	5.1	5th.	5.2	5.2	5.2	5.3	5.3	5.3	5.4	5.4	5.4	5.4	
11th.	5.0	5.0	5.0	5.1	5.1	5.1	5.1	5.1	5.1	10th.	5.2	5.2	5.2	5.3	5.3	5.3	5.4	5.4	5.4	5.4	
16th.	5.0	5.0	5.0	5.1	5.1	5.1	5.1	5.1	5.1	15th.	5.2	5.2	5.2	5.3	5.3	5.3	5.4	5.4	5.4	5.4	
21st.	5.0	5.0	5.0	5.1	5.1	5.1	5.1	5.1	5.1	20th.	5.2	5.2	5.2	5.3	5.3	5.3	5.4	5.4	5.4	5.4	
26th.	5.0	5.0	5.0	5.1	5.1	5.1	5.1	5.1	5.1	25th.	5.2	5.2	5.2	5.3	5.3	5.3	5.4	5.4	5.4	5.4	
31st.	5.0	5.0	5.0	5.1	5.1	5.1	5.1	5.1	5.1	30th.	5.2	5.2	5.2	5.3	5.3	5.3	5.4	5.4	5.4	5.4	

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	0 0 37.17	11.281	- 1 12 40.5	77.00	1 25.4	1	2 21 51.53	11.748	+14 9 13.1	66.04	1 44.5
2	0 5 7.77	11.270	0 41 34.9	77.77	1 26.0	2	2 26 33.92	11.788	14 35 27.9	66.18	1 45.3
3	0 9 38.14	11.262	- 0 10 27.6	77.62	1 26.6	3	2 31 17.21	11.823	15 1 21.5	64.98	1 46.1
4	0 14 8.33	11.255	+ 0 20 40.7	77.85	1 27.1	4	2 36 1.43	11.862	15 26 53.3	63.35	1 46.9
5	0 18 38.39	11.251	0 51 49.2	77.84	1 27.7	5	2 40 46.59	11.901	15 52 2.6	62.40	1 47.7
6	0 23 8.36	11.248	1 22 57.1	77.80	1 28.2	6	2 45 32.70	11.941	16 16 48.5	61.40	1 48.5
7	0 27 38.29	11.247	1 54 3.8	77.74	1 28.8	7	2 50 19.77	11.982	16 41 10.0	60.38	1 49.4
8	0 32 8.22	11.248	2 25 8.5	77.64	1 29.4	8	2 55 7.82	12.023	17 5 6.5	59.33	1 50.2
9	0 36 38.20	11.251	2 56 10.4	77.51	1 29.9	9	2 59 56.89	12.068	17 28 37.4	58.24	1 51.1
10	0 41 8.26	11.255	3 27 8.9	77.35	1 30.5	10	3 4 46.97	12.108	17 51 42.0	57.12	1 52.0
11	0 45 38.45	11.262	3 58 3.2	77.16	1 31.0	11	3 9 38.07	12.151	18 14 19.7	56.00	1 52.9
12	0 50 8.82	11.270	4 28 52.7	76.94	1 31.6	12	3 14 30.20	12.189	18 36 29.8	54.68	1 53.9
13	0 54 39.41	11.280	4 59 36.6	76.69	1 32.2	13	3 19 23.36	12.236	18 58 11.5	53.68	1 54.8
14	0 59 10.26	11.292	5 30 14.2	76.42	1 32.7	14	3 24 17.55	12.279	19 19 23.9	52.39	1 55.8
15	1 3 41.41	11.306	6 0 44.7	76.11	1 33.2	15	3 29 12.76	12.322	19 40 6.4	51.18	1 56.7
16	1 8 12.89	11.319	6 31 7.5	75.77	1 33.8	16	3 34 8.99	12.364	20 0 18.4	49.86	1 57.7
17	1 12 44.75	11.336	7 1 21.6	75.39	1 34.5	17	3 39 6.24	12.406	20 19 59.2	48.64	1 58.7
18	1 17 17.03	11.355	7 31 26.2	74.97	1 35.1	18	3 44 4.49	12.447	20 39 8.2	47.19	1 59.7
19	1 21 49.77	11.374	8 1 20.8	74.55	1 35.8	19	3 49 3.73	12.488	20 57 44.7	45.88	2 0.7
20	1 26 23.00	11.395	8 31 4.6	74.09	1 36.4	20	3 54 3.94	12.528	21 15 48.0	44.43	2 1.8
21	1 30 56.76	11.418	9 0 36.9	73.59	1 37.0	21	3 59 5.09	12.566	21 33 17.6	43.01	2 2.9
22	1 35 31.07	11.442	9 29 56.9	73.05	1 37.6	22	4 4 7.16	12.603	21 50 12.7	41.57	2 4.0
23	1 40 5.96	11.466	9 59 3.8	72.50	1 38.3	23	4 9 10.11	12.641	22 6 32.8	40.09	2 5.1
24	1 44 41.48	11.493	10 27 56.8	71.90	1 38.9	24	4 14 13.93	12.677	22 22 17.3	38.60	2 6.2
25	1 49 17.66	11.521	10 56 35.3	71.28	1 39.6	25	4 19 18.50	12.711	22 37 25.8	37.09	2 7.4
26	1 53 54.51	11.550	11 24 58.3	70.62	1 40.2	26	4 24 24.06	12.744	22 51 57.6	35.55	2 8.6
27	1 58 32.07	11.581	11 53 5.2	69.92	1 40.9	27	4 29 30.29	12.778	23 5 52.3	33.99	2 9.8
28	2 3 10.37	11.613	12 20 55.3	69.22	1 41.6	28	4 34 37.25	12.804	23 19 9.2	32.41	2 10.9
29	2 7 49.44	11.644	12 48 27.9	68.48	1 42.3	29	4 39 44.89	12.832	23 31 47.9	30.81	2 12.1
30	2 12 29.32	11.677	13 15 42.3	67.70	1 43.1	30	4 44 53.18	12.866	23 43 48.0	29.19	2 13.2
31	2 17 10.00	11.713	13 42 37.7	66.89	1 43.8	31	4 50 2.07	12.892	23 55 9.1	27.66	2 14.2
32	2 21 51.53	11.748	+14 9 13.1	66.04	1 44.5	32	4 55 11.50	12.908	+24 5 50.8	26.91	2 15.4
Day of Month, 3d.						Day of Month, 1st.					
Semidiam. 5.4						Semidiam. 5.8					
Hor. Par. 5.4						Hor. Par. 5.9					
7th.	5.4	5.5	5.6	5.7	5.8	6th.	6.0	6.1	6.2	6.3	6.4
19th.	5.5	5.6	5.7	5.8	5.9	11th.	6.1	6.2	6.3	6.4	6.6
17th.	5.6	5.7	5.8	5.9	6.0	16th.	6.2	6.3	6.4	6.5	6.6
30d.	5.7	5.8	5.9	6.0	6.1	21st.	6.3	6.4	6.5	6.6	6.6
27th.	5.8	5.9	6.0	6.1	6.2	26th.	6.4	6.5	6.6	6.6	6.6
33d.	5.9	6.0	6.1	6.2	6.3	31st.	6.5	6.6	6.6	6.6	6.6

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m		^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m
1	4 50 2.07	12.832	+23 55 9.1	27.56	2 14.2	1	7 29 24.83	12.804	+24 6 34.6	28.28	2 51.6
2	4 55 11.50	12.908	24 5 50.8	28.91	2 15.4	2	7 34 21.62	12.887	23 56 8.9	28.54	2 52.6
3	5 0 21.44	12.928	24 15 52.7	24.24	2 16.7	3	7 39 17.03	12.279	23 45 6.2	28.87	2 53.6
4	5 5 31.83	12.943	24 25 14.3	22.55	2 17.9	4	7 44 11.02	12.219	23 33 26.9	28.89	2 54.5
5	5 10 42.63	12.967	24 32 55.4	20.80	2 19.2	5	7 49 3.54	12.187	23 21 11.6	21.85	2 55.5
6	5 15 53.79	12.972	24 41 55.8	18.16	2 20.6	6	7 53 54.54	12.090	23 8 20.8	28.84	2 56.4
7	5 21 5.27	12.983	24 49 15.2	17.44	2 21.9	7	7 58 43.99	12.027	22 54 55.2	24.28	2 57.2
8	5 26 17.00	12.993	24 55 53.1	18.71	2 23.1	8	8 3 31.85	11.960	22 40 55.3	23.70	2 58.1
9	5 31 28.93	12.999	25 1 49.3	18.97	2 24.4	9	8 8 18.09	11.888	22 26 21.7	27.09	2 58.9
10	5 36 40.97	13.008	25 7 3.9	12.23	2 25.6	10	8 13 2.71	11.804	22 11 15.1	28.48	2 59.8
11	5 41 53.07	13.004	25 11 36.5	10.48	2 26.9	11	8 17 45.66	11.764	21 55 36.0	28.79	3 0.5
12	5 47 5.18	13.008	25 15 27.0	8.73	2 28.2	12	8 22 26.89	11.662	21 39 25.0	41.16	3 1.2
13	5 52 17.24	13.000	25 18 35.4	6.97	2 29.4	13	8 27 6.38	11.609	21 22 43.1	43.39	3 1.9
14	5 57 29.17	12.993	25 21 1.5	5.21	2 30.7	14	8 31 44.13	11.536	21 5 30.8	43.63	3 2.6
15	6 2 40.91	12.984	25 22 45.4	3.45	2 31.9	15	8 36 20.10	11.461	20 47 48.8	44.06	3 3.3
16	6 7 52.39	12.972	25 23 47.1	+1.09	2 33.2	16	8 40 54.26	11.385	20 29 37.6	46.06	3 3.9
17	6 13 3.55	12.945	25 24 6.6	-0.07	2 34.4	17	8 45 26.58	11.308	20 10 53.1	47.22	3 4.4
18	6 18 14.30	12.898	25 23 43.9	1.89	2 35.6	18	8 49 57.06	11.231	19 51 50.9	48.36	3 5.0
19	6 23 24.59	12.917	25 22 39.2	3.57	2 36.9	19	8 54 25.67	11.153	19 32 16.9	49.46	3 5.5
20	6 28 34.34	12.884	25 20 52.6	5.31	2 38.1	20	8 58 52.39	11.074	19 12 16.7	50.52	3 6.1
21	6 33 42.49	12.867	25 18 24.2	7.04	2 39.3	21	9 3 17.21	10.994	18 51 51.3	51.57	3 6.5
22	6 38 51.96	12.887	25 15 14.3	8.77	2 40.5	22	9 7 40.10	10.918	18 31 1.2	52.68	3 6.9
23	6 43 59.67	12.804	25 11 23.1	10.49	2 41.7	23	9 12 1.04	10.832	18 9 47.2	53.56	3 7.3
24	6 49 6.57	12.769	25 6 50.9	12.19	2 42.8	24	9 16 20.04	10.761	17 48 10.2	54.51	3 7.7
25	6 54 12.60	12.732	25 1 37.8	13.89	2 44.0	25	9 20 37.08	10.689	17 26 10.8	55.43	3 8.1
26	6 59 17.69	12.691	24 55 44.3	15.56	2 45.2	26	9 24 52.14	10.606	17 3 49.7	56.31	3 8.3
27	7 4 21.77	12.647	24 49 10.7	17.22	2 46.3	27	9 29 5.21	10.508	16 41 7.7	57.17	3 8.6
28	7 9 24.75	12.600	24 41 57.3	18.88	2 47.4	28	9 33 16.30	10.430	16 18 5.6	57.99	3 8.9
29	7 14 26.59	12.562	24 34 4.5	20.51	2 48.4	29	9 37 25.38	10.337	15 54 44.1	58.78	3 9.1
30	7 19 27.26	12.502	24 25 32.8	22.12	2 49.5	30	9 41 32.46	10.233	15 31 4.1	59.54	3 9.3
31	7 24 26.60	12.449	24 16 22.7	23.71	2 50.6	31	9 45 37.54	10.100	15 7 6.3	60.27	3 9.4
32	7 29 24.83	12.394	+24 6 34.6	25.28	2 51.6	32	9 49 40.62	10.067	+14 42 51.1	60.97	3 9.5
Day of Month, 1st.						Day of the Month, 5th.					
Semidiam. ["] 6.6						Semidiameter ["] 8.1					
Hor. Par. 6.6						Hor. Parallax 8.1					
	6th.	11th.	16th.	21st.	26th.	31st.		5th.	10th.	15th.	20th.
	["] 6.7	["] 6.9	["] 7.1	["] 7.3	["] 7.6	["] 7.8		["] 8.4	["] 8.7	["] 9.1	["] 9.5
	6.8	7.0	7.2	7.4	7.6	7.9		8.8	9.1	9.5	10.0

GREENWICH MEAN TIME.

JULY.

AUGUST.

Day of Month.	Apparent Right Ascension.		Var. of R.A. for 1 Hour.	Apparent Declination.		Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.		Var. of R.A. for 1 Hour.	Apparent Declination.		Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.		Noon.	Noon.		Noon.			Noon.		Noon.	Noon.		Noon.	
	h	m s	s	°	' "	"			h	m	s	s	°	' "	
1	9	45 37.54	10.100	+15	7 6.3	00.27	3 9.4	1	11 35 5.38	7.344	+ 1 22	8.0	07.74	2 56.5	
2	9	49 40.62	10.097	14 42	51.1	00.07	3 9.5	2	11 38 0.30	7.261	0 55	5.2	07.46	2 55.4	
3	9	53 41.70	10.093	14 18	19.4	01.65	3 9.6	3	11 40 52.47	7.116	0 28	9.4	07.16	2 54.3	
4	9	57 40.76	9.919	13 53	31.8	02.29	3 9.7	4	11 43 41.81	6.996	+ 0 1	21.3	06.83	2 53.2	
5	10	1 37.81	9.835	13 28	29.1	03.02	3 9.7	5	11 46 28.27	6.874	- 0 25	18.3	06.45	2 51.9	
6	10	5 32.85	9.751	13 3	12.0	04.49	3 9.6	6	11 49 11.77	6.760	0 51	48.5	06.04	2 50.7	
7	10	9 25.88	9.667	12 37	41.4	04.04	3 9.5	7	11 51 52.24	6.631	1 18	8.4	05.60	2 49.4	
8	10	13 16.89	9.584	12 11	58.1	04.56	3 9.4	8	11 54 29.59	6.498	1 44	17.1	05.11	2 48.2	
9	10	17 5.90	9.500	11 46	2.6	05.05	3 9.3	9	11 57 3.70	6.352	2 10	13.6	04.58	2 46.9	
10	10	20 52.89	9.416	11 19	55.6	05.61	3 9.2	10	11 59 34.49	6.211	2 35	57.1	04.02	2 45.4	
11	10	24 37.88	9.332	10 53	37.9	05.96	3 8.9	11	12 2 1.84	6.066	3 1	26.4	03.40	2 43.8	
12	10	28 20.84	9.247	10 27	10.0	06.26	3 8.7	12	12 4 25.65	5.916	3 26	40.4	02.74	2 42.2	
13	10	32 1.77	9.163	10 0	32.7	06.73	3 8.5	13	12 6 45.81	5.761	3 51	38.1	02.04	2 40.7	
14	10	35 40.66	9.077	9 33	46.8	07.07	3 8.2	14	12 9 2.18	5.602	4 16	18.4	01.30	2 39.2	
15	10	39 17.49	8.991	9 6	53.1	07.38	3 7.8	15	12 11 14.62	5.483	4 40	40.1	00.49	2 37.5	
16	10	42 52.25	8.906	8 39	52.4	07.60	3 7.4	16	12 13 22.99	5.361	5 4	42.0	00.64	2 35.5	
17	10	46 24.93	8.818	8 12	45.5	07.91	3 7.0	17	12 15 27.12	5.081	5 28	22.8	00.73	2 33.7	
18	10	49 55.52	8.730	7 45	32.9	08.12	3 6.6	18	12 17 26.87	4.894	5 51	41.1	00.77	2 31.8	
19	10	53 23.98	8.641	7 18	15.5	08.31	3 6.2	19	12 19 22.04	4.700	6 14	35.6	00.74	2 29.8	
20	10	56 50.27	8.600	6 50	54.2	08.45	3 5.7	20	12 21 12.47	4.498	6 37	4.8	00.64	2 27.8	
21	11	0 14.38	8.450	6 23	29.7	08.57	3 5.1	21	12 22 57.96	4.289	6 59	7.4	00.51	2 25.5	
22	11	3 36.29	8.366	5 56	2.8	08.66	3 4.5	22	12 24 38.33	4.071	7 20	41.5	00.29	2 23.2	
23	11	6 55.95	8.272	5 28	34.1	08.71	3 3.9	23	12 26 13.39	3.846	7 41	45.6	00.01	2 20.8	
24	11	10 13.33	8.176	5 1	4.6	08.78	3 3.3	24	12 27 42.93	3.611	8 2	17.9	00.00	2 18.4	
25	11	13 28.39	8.079	4 33	35.0	08.72	3 2.6	25	12 29 6.75	3.369	8 22	16.7	00.21	2 15.7	
26	11	16 41.10	7.979	4 6	5.9	08.63	3 1.8	26	12 30 24.64	3.117	8 41	40.1	00.70	2 13.0	
27	11	19 51.41	7.878	3 38	38.2	08.61	3 1.0	27	12 31 36.38	2.857	9 0	26.1	00.09	2 10.1	
28	11	22 59.26	7.776	3 11	12.7	08.50	3 0.2	28	12 32 41.76	2.587	9 18	32.7	00.41	2 7.3	
29	11	26 4.63	7.071	2 43	50.1	08.38	2 59.4	29	12 33 40.59	2.311	9 35	57.8	00.84	2 4.6	
30	11	29 7.49	7.066	2 16	31.3	08.19	2 58.5	30	12 34 32.66	2.026	9 52	39.4	00.76	2 1.5	
31	11	32 7.76	7.456	1 49	17.0	07.98	2 57.5	31	12 35 17.78	1.781	10 8	35.2	00.82	1 58.2	
32	11	35 5.38	7.344	+ 1 22	8.0	07.74	2 56.5	32	12 35 55.75	1.439	-10 23	42.8	00.76	1 54.9	
Day of the Month, 5th. 10th. 15th. 20th. 25th. 30th.								Day of the Month, 4th. 9th. 14th. 19th. 24th. 29th.							
Semidiameter		10.4	10.9	11.5	12.2	12.9	13.8	Semidiameter		14.7	15.8	17.0	18.3	19.8	21.5
Hor. Parallax		10.5	11.0	11.6	12.3	13.0	13.9	Hor. Parallax		14.8	15.9	17.1	18.4	19.9	21.6

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	12 35 55.75	1.429	10 23 42.8	36.76	1 54.9	1	12 0 16.19	5.067	8 50 12.7	51.98	23 15.6
2	12 36 26.39	1.120	10 37 59.9	34.61	1 51.5	2	11 58 16.42	4.897	8 29 8.7	53.18	23 9.8
3	12 36 49.52	0.803	10 51 23.9	32.34	1 48.0	3	11 56 21.11	4.696	8 7 39.9	54.08	23 4.0
4	12 37 4.96	0.480	11 3 52.2	29.97	1 44.3	4	11 54 31.02	4.464	7 45 54.3	54.56	22 58.4
5	12 37 12.56	+0.151	11 15 22.3	27.48	1 40.3	5	11 52 46.83	4.206	7 23 59.8	54.79	22 52.9
6	12 37 12.25	-0.183	11 25 51.3	24.87	1 36.4	6	11 51 9.12	3.924	7 2 4.1	54.70	22 47.6
7	12 37 3.76	0.522	14 35 16.4	22.16	1 32.4	7	11 49 38.44	3.623	6 40 14.3	54.31	22 42.3
8	12 36 47.14	0.864	11 43 34.9	19.33	1 28.3	8	11 48 15.28	3.299	6 18 37.4	53.63	22 37.0
9	12 36 22.28	1.208	11 50 44.4	16.39	1 23.9	9	11 47 0.05	2.962	5 57 20.1	52.68	22 32.0
10	12 35 49.12	1.554	11 56 42.0	13.34	1 19.3	10	11 45 53.07	2.613	5 36 28.5	51.50	22 27.4
11	12 35 7.68	1.898	12 1 24.8	10.17	1 14.6	11	11 44 54.61	2.284	5 16 8.2	50.08	22 22.7
12	12 34 18.01	2.239	12 4 50.0	6.88	1 10.0	12	11 44 4.87	1.887	4 56 24.6	48.46	22 18.0
13	12 33 23.20	2.576	12 6 55.2	3.52	1 5.2	13	11 43 24.03	1.514	4 37 22.4	46.66	22 13.2
14	12 32 14.39	2.905	12 7 38.7	-0.06	1 0.1	14	11 42 52.19	1.139	4 19 5.3	44.69	22 8.7
15	12 31 0.77	3.226	12 6 58.3	+3.46	0 54.7	15	11 42 29.39	0.762	4 1 37.3	42.57	22 4.3
16	12 29 39.59	3.533	12 4 52.1	7.07	0 49.4	16	11 42 15.61	0.387	3 45 1.8	40.33	22 0.1
17	12 28 11.16	3.828	12 1 18.9	10.71	0 44.1	17	11 42 10.83	-0.013	3 29 21.2	38.01	21 56.2
18	12 26 35.84	4.106	11 56 17.8	14.38	0 38.8	18	11 42 15.00	+0.338	3 14 37.5	35.69	21 52.8
19	12 24 54.08	4.368	11 49 48.5	18.05	0 33.3	19	11 42 22.00	0.723	3 0 52.4	33.13	21 49.3
20	12 23 6.41	4.597	11 41 51.4	21.68	0 27.5	20	11 42 49.71	1.068	2 48 7.6	30.58	21 46.0
21	12 21 13.40	4.807	11 32 27.3	25.28	0 21.8	21	11 43 19.99	1.437	2 36 24.3	28.01	21 42.7
22	12 19 15.68	4.996	11 21 37.6	28.82	0 15.8	22	11 43 58.68	1.793	2 25 43.0	25.48	21 39.4
23	12 17 13.98	5.138	11 9 24.3	32.28	0 9.8	23	11 44 45.59	2.131	2 16 4.2	23.81	21 36.4
24	12 15 9.06	5.264	10 55 50.4	35.49	0 3.8	24	11 45 40.50	2.449	2 7 28.0	20.21	21 33.7
25	12 13 1.78	5.337	10 41 0.1	38.56	23 51.7	25	11 46 43.18	2.770	1 59 54.3	17.61	21 30.9
26	12 10 52.92	5.383	10 24 58.1	41.48	23 45.6	26	11 47 53.41	3.061	1 53 22.7	15.03	21 28.2
27	12 8 43.39	5.393	10 7 49.4	44.14	23 39.6	27	11 49 11.06	3.323	1 47 52.7	12.48	21 25.6
28	12 6 34.08	5.365	9 49 39.6	46.54	23 33.6	28	11 50 35.83	3.576	1 43 23.9	9.96	21 23.1
29	12 4 25.86	5.301	9 30 35.4	48.65	23 27.5	29	11 52 7.50	3.806	1 39 55.2	7.46	21 20.8
30	12 2 19.62	5.301	9 10 44.0	50.46	23 21.5	30	11 53 45.84	4.231	1 37 25.7	5.02	21 18.7
31	12 0 16.11	5.067	8 50 12.7	51.98	23 15.6	31	11 55 30.61	4.484	1 35 54.4	3.62	21 16.6
32	11 58 16.42	4.897	8 29 8.7	53.18	23 9.8	32	11 57 21.57	4.747	1 35 20.1	0.37	21 14.5
Day of the Month, 3d. 6th. 13th. 18th. 23d. 28th.						Day of the Month, 3d. 6th. 13th. 18th. 23d. 28th.					
Semidiameter 23.3 25.2 27.0 28.7 29.8 30.5						Semidiameter 30.3 29.4 27.9 26.2 24.3 22.5					
Hor. Parallax 23.4 25.3 27.2 28.9 30.1 30.7						Hor. Parallax 30.5 29.6 28.1 26.3 24.5 22.6					

GREENWICH MEAN TIME.

NOVEMBER

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.				Noon.				
	^h	^m	^s	^s	^o	[']	["]	["]	^h ^m
1	11	57	21.57	4.747	1	35	20.1	+0.27	21 14.5
2	11	59	18.50	4.992	1	35	41.6	-2.03	21 12.7
3	12	1	21.17	5.236	1	36	57.5	4.36	21 11.0
4	12	3	29.35	5.481	1	39	6.3	6.43	21 9.2
5	12	5	42.83	5.667	1	42	6.4	8.54	21 7.6
6	12	8	1.39	5.874	1	45	56.5	10.80	21 6.0
7	12	10	24.80	6.073	1	50	35.2	13.80	21 4.4
8	12	12	52.88	6.263	1	56	1.1	14.83	21 3.0
9	12	15	25.44	6.446	2	2	12.5	16.39	21 1.8
10	12	18	2.29	6.621	2	9	8.0	18.20	21 0.5
11	12	20	43.26	6.790	2	16	46.2	19.94	20 59.3
12	12	23	28.19	6.961	2	25	5.7	21.64	20 58.1
13	12	26	16.90	7.106	2	34	5.1	23.27	20 57.0
14	12	29	9.26	7.246	2	43	42.9	24.84	20 56.2
15	12	32	5.13	7.386	2	53	57.7	26.26	20 55.2
16	12	35	4.38	7.527	3	4	48.1	27.81	20 54.2
17	12	38	6.89	7.670	3	16	12.8	29.21	20 53.2
18	12	41	12.54	7.798	3	28	10.4	30.66	20 52.4
19	12	44	21.21	7.922	3	40	39.6	31.86	20 51.6
20	12	47	32.81	8.043	3	53	39.1	33.09	20 50.9
21	12	50	47.24	8.160	4	7	7.7	34.27	20 50.2
22	12	54	4.42	8.273	4	21	4.1	35.41	20 49.6
23	12	57	24.27	8.381	4	35	27.2	36.49	20 49.1
24	13	0	46.72	8.486	4	50	15.6	37.62	20 48.6
25	13	4	11.70	8.592	5	5	28.1	38.80	20 48.1
26	13	7	39.15	8.698	5	21	3.5	39.43	20 47.6
27	13	11	8.98	8.791	5	37	0.7	40.31	20 47.2
28	13	14	41.14	8.887	5	53	18.4	41.14	20 46.9
29	13	18	15.57	8.980	6	9	55.4	41.92	20 46.6
30	13	21	52.20	9.071	6	26	50.5	42.65	20 46.3
31	13	25	30.98	9.160	6	44	2.5	43.32	20 46.0
32	13	29	11.88	9.247	7	1	30.1	43.96	20 45.7

DECEMBER

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.				Noon.				
	h	m	s	s	°	'	"	"	h m
1	13	25	30.98	9.160	6	44	2.5	43.32	20 46.0
2	13	29	11.88	9.247	7	1	30.1	43.96	20 45.7
3	13	32	54.84	9.323	7	19	12.1	44.52	20 45.6
4	13	36	39.82	9.415	7	37	7.3	45.04	20 45.4
5	13	40	26.78	9.497	7	55	14.6	45.53	20 45.3
6	13	44	15.67	9.576	8	13	32.9	46.07	20 45.2
7	13	48	6.44	9.654	8	32	1.1	46.36	20 45.0
8	13	51	59.07	9.731	8	50	38.1	46.70	20 45.0
9	13	55	53.51	9.806	9	9	22.8	47.00	20 45.0
10	13	59	49.74	9.879	9	28	14.1	47.35	20 45.1
11	14	3	47.74	9.963	9	47	10.8	47.45	20 45.1
12	14	7	47.49	10.026	10	6	12.0	47.62	20 45.1
13	14	11	48.96	10.097	10	25	16.7	47.76	20 45.2
14	14	15	52.14	10.169	10	44	23.8	47.82	20 45.4
15	14	19	57.00	10.237	11	3	32.0	47.84	20 45.5
16	14	24	3.52	10.306	11	22	40.4	47.83	20 45.7
17	14	28	11.70	10.375	11	41	48.0	47.78	20 45.9
18	14	32	21.53	10.443	12	0	54.0	47.70	20 46.2
19	14	36	33.00	10.512	12	19	57.5	47.67	20 46.5
20	14	40	46.11	10.580	12	38	57.3	47.40	20 46.8
21	14	45	0.85	10.648	12	57	52.5	47.19	20 47.1
22	14	49	17.23	10.716	13	16	42.0	46.92	20 47.4
23	14	53	35.22	10.783	13	35	24.9	46.68	20 47.8
24	14	57	54.83	10.851	13	54	0.3	46.30	20 48.3
25	15	2	16.05	10.917	14	12	27.3	45.94	20 48.7
26	15	6	38.88	10.984	14	30	44.8	45.51	20 49.2
27	15	11	3.30	11.061	14	48	51.8	45.06	20 49.6
28	15	15	29.32	11.117	15	6	47.5	44.56	20 50.2
29	15	19	56.92	11.163	15	24	30.9	44.03	20 50.7
30	15	24	26.09	11.248	15	42	1.1	43.46	20 51.3
31	15	28	56.83	11.313	15	59	17.2	42.83	20 51.8
32	15	33	29.12	11.377	16	16	18.2	42.31	20 52.4

Day of the Month, 3d. 7th. 13th. 17th. 23d. 27th.

Semidiameter ["] 20.8 19.2 17.8 16.7 15.5 14.5
 Hor. Parallax ["] 20.9 19.4 18.0 16.7 15.6 14.6

Day of Month, 3d. 7th. 13th. 17th. 23d. 27th. 31d.

Semidiam. ["] 13.6 12.9 12.2 11.5 11.0 10.5 10.0
 Hor. Par. ["] 13.7 12.9 12.3 11.6 11.1 10.6 10.1

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	1 24 20.95	4.891	+ 9 38 43.1	29.22	6 41.1	1	2 25 46.20	5.438	+15 40 29.0	28.04	5 40.5
2	1 26 6.80	4.482	9 50 24.6	29.29	6 39.0	2	2 27 57.04	5.465	15 51 40.5	27.90	5 38.7
3	1 27 53.67	4.473	10 2 8.2	29.35	6 36.8	3	2 30 8.51	5.491	16 2 48.3	27.75	5 37.0
4	1 29 41.53	4.514	10 13 53.2	29.40	6 34.7	4	2 32 20.61	5.517	16 13 52.4	27.60	5 35.3
5	1 31 30.35	4.554	10 25 39.3	29.44	6 32.6	5	2 34 33.32	5.543	16 24 52.7	27.44	5 33.6
6	1 33 20.12	4.593	10 37 26.4	29.48	6 30.5	6	2 36 46.64	5.568	16 35 49.2	27.27	5 31.9
7	1 35 10.83	4.632	10 49 14.2	29.50	6 28.4	7	2 39 0.56	5.592	16 46 41.6	27.10	5 30.2
8	1 37 2.45	4.670	11 1 2.6	29.52	6 26.3	8	2 41 15.07	5.617	16 57 29.7	26.92	5 28.5
9	1 38 54.96	4.707	11 12 51.3	29.53	6 24.2	9	2 43 30.18	5.642	17 8 13.5	26.73	5 26.8
10	1 40 48.35	4.743	11 24 40.3	29.54	6 22.2	10	2 45 45.89	5.666	17 18 52.8	26.54	5 25.1
11	1 42 42.62	4.779	11 36 20.4	29.54	6 20.2	11	2 48 2.18	5.690	17 29 27.5	26.35	5 23.4
12	1 44 37.74	4.815	11 48 18.4	29.54	6 18.2	12	2 50 19.05	5.715	17 39 57.5	26.16	5 21.7
13	1 46 33.71	4.850	12 0 7.3	29.53	6 16.2	13	2 52 36.50	5.739	17 50 22.7	25.95	5 20.1
14	1 48 30.53	4.885	12 11 55.9	29.52	6 14.2	14	2 54 54.53	5.763	18 0 43.0	25.74	5 18.5
15	1 50 28.19	4.919	12 23 44.0	29.49	6 12.2	15	2 57 13.13	5.787	18 10 58.2	25.53	5 16.8
16	1 52 26.68	4.953	12 35 31.5	29.46	6 10.2	16	2 59 32.31	5.811	18 21 8.2	25.31	5 15.2
17	1 54 25.98	4.987	12 47 18.2	29.42	6 8.2	17	3 1 52.06	5.834	18 31 12.9	25.08	5 13.6
18	1 56 26.10	5.021	12 59 3.9	29.38	6 6.3	18	3 4 12.36	5.857	18 41 12.1	24.85	5 12.0
19	1 58 27.03	5.055	13 10 48.5	29.33	6 4.4	19	3 6 33.21	5.880	18 51 5.7	24.62	5 10.4
20	2 0 28.73	5.087	13 22 31.7	29.27	6 2.5	20	3 8 54.60	5.903	19 0 53.7	24.38	5 8.8
21	2 2 31.20	5.119	13 34 13.4	29.21	6 0.6	21	3 11 16.54	5.926	19 10 35.7	24.13	5 7.2
22	2 4 34.44	5.151	13 45 53.5	29.14	5 58.7	22	3 13 39.02	5.948	19 20 11.7	23.88	5 5.6
23	2 6 38.44	5.182	13 57 31.9	29.06	5 56.8	23	3 16 2.02	5.969	19 29 41.6	23.62	5 4.1
24	2 8 43.17	5.212	14 9 8.2	28.97	5 54.9	24	3 18 25.53	5.990	19 39 5.3	23.35	5 2.6
25	2 10 48.63	5.242	14 20 42.4	28.88	5 53.1	25	3 20 49.54	6.011	19 48 22.6	23.08	5 1.0
26	2 12 54.81	5.272	14 32 14.4	28.78	5 51.3	26	3 23 14.04	6.032	19 57 33.4	22.80	4 59.5
27	2 15 1.69	5.301	14 43 43.9	28.67	5 49.5	27	3 25 39.03	6.052	20 6 37.6	22.52	4 58.0
28	2 17 9.26	5.329	14 55 10.8	28.56	5 47.7	28	3 28 4.50	6.071	20 15 35.2	22.24	4 56.5
29	2 19 17.50	5.357	15 6 35.0	28.44	5 45.9	29	3 30 30.44	6.090	20 24 26.0	21.96	4 55.0
30	2 21 26.41	5.385	15 17 56.2	28.31	5 44.1	30	3 32 56.84	6.109	20 33 9.7	21.67	4 53.5
31	2 23 35.99	5.412	15 29 14.2	28.18	5 42.3	31	3 35 23.69	6.128	20 41 46.3	21.38	4 52.0
32	2 25 46.20	5.438	+15 40 29.0	28.04	5 40.5	32	3 37 50.98	6.147	+20 50 15.7	21.08	4 50.5
Day of the Month,						Day of the Month,					
1st.						2d.					
9th.						10th.					
17th.						18th.					
25th.						26th.					
Polar Semidiameter						Polar Semidiameter					
Horizontal Parallax						Horizontal Parallax					
5.4						4.1					
5.0						3.8					
4.6						3.6					
4.3						3.4					
9.1						6.9					
8.4						6.4					
7.8						6.0					
7.3						5.7					

GREENWICH MEAN TIME.

MARCH.						APRIL					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	3 30 30.44	6.000	+20 24 26.0	21.96	4 55.0	1	4 49 17.13	6.571	+23 53 1.3	11.10	4 11.6
2	3 32 56.84	6.109	20 33 9.7	21.67	4 53.5	2	4 51 54.98	6.592	23 57 22.8	10.09	4 10.3
3	3 35 23.69	6.129	20 41 46.3	21.39	4 52.0	3	4 54 33.06	6.592	24 1 34.5	10.29	4 9.0
4	3 37 50.98	6.147	20 50 15.7	21.08	4 50.5	4	4 57 11.41	6.602	24 5 36.4	9.88	4 7.7
5	3 40 18.71	6.169	20 58 37.9	20.77	4 49.0	5	4 59 49.97	6.613	24 9 28.6	9.47	4 6.4
6	3 42 46.89	6.189	21 6 52.7	20.46	4 47.6	6	5 2 28.76	6.621	24 13 10.8	9.06	4 5.1
7	3 45 15.50	6.201	21 15 0.0	20.16	4 46.1	7	5 5 7.77	6.630	24 16 43.1	8.65	4 3.8
8	3 47 44.54	6.219	21 22 59.7	19.83	4 44.6	8	5 7 46.99	6.638	24 20 5.5	8.23	4 2.5
9	3 50 14.01	6.237	21 30 51.8	19.51	4 43.1	9	5 10 26.41	6.646	24 23 17.9	7.82	4 1.2
10	3 52 43.90	6.264	21 38 36.1	19.18	4 41.7	10	5 13 6.03	6.654	24 26 20.2	7.40	3 59.9
11	3 55 14.20	6.271	21 46 12.5	18.85	4 40.3	11	5 15 45.85	6.662	24 29 12.5	6.97	3 58.6
12	3 57 44.91	6.298	21 53 40.9	18.52	4 38.8	12	5 18 25.87	6.670	24 31 54.6	6.54	3 57.3
13	4 0 16.04	6.308	22 1 1.3	18.18	4 37.4	13	5 21 6.07	6.677	24 34 26.4	6.11	3 56.1
14	4 2 47.58	6.322	22 8 13.6	17.84	4 36.0	14	5 23 46.43	6.684	24 36 48.0	5.69	3 54.9
15	4 5 19.52	6.339	22 15 17.6	17.50	4 34.6	15	5 26 26.96	6.691	24 38 59.4	5.26	3 53.6
16	4 7 51.86	6.356	22 22 13.3	17.15	4 33.2	16	5 29 7.66	6.697	24 41 0.4	4.82	3 52.3
17	4 10 24.59	6.373	22 29 0.5	16.79	4 31.8	17	5 31 48.52	6.703	24 42 51.2	4.39	3 51.0
18	4 12 57.71	6.388	22 35 39.2	16.44	4 30.4	18	5 34 29.52	6.708	24 44 31.6	3.96	3 49.8
19	4 15 31.21	6.404	22 42 9.3	16.08	4 29.0	19	5 37 10.64	6.718	24 46 1.6	3.53	3 48.6
20	4 18 5.08	6.419	22 48 30.7	15.72	4 27.6	20	5 39 51.89	6.719	24 47 21.2	3.10	3 47.3
21	4 20 39.31	6.434	22 54 43.4	15.35	4 26.3	21	5 42 33.25	6.722	24 48 30.3	2.67	3 46.0
22	4 23 13.90	6.449	23 0 47.3	14.98	4 24.9	22	5 45 14.71	6.726	24 49 29.0	2.23	3 44.7
23	4 25 48.85	6.463	23 6 42.2	14.60	4 23.5	23	5 47 56.26	6.729	24 50 17.2	1.79	3 43.5
24	4 30 24.13	6.476	23 12 28.1	14.22	4 22.2	24	5 50 37.87	6.732	24 50 55.0	1.35	3 42.3
25	4 33 59.72	6.489	23 18 5.0	13.84	4 20.9	25	5 53 19.55	6.735	24 51 22.4	0.92	3 41.0
26	4 36 35.61	6.502	23 23 32.7	13.46	4 19.6	26	5 56 1.30	6.738	24 51 39.2	0.48	3 39.7
27	4 36 11.81	6.518	23 28 51.1	13.07	4 18.2	27	5 58 43.10	6.740	24 51 45.5	0.06	3 38.4
28	4 38 48.31	6.527	23 34 0.1	12.68	4 16.9	28	6 1 24.94	6.742	24 51 41.4	0.39	3 37.2
29	4 41 25.11	6.539	23 38 59.6	12.29	4 15.6	29	6 4 6.80	6.743	24 51 26.7	0.09	3 36.0
30	4 44 2.20	6.549	23 43 49.6	11.90	4 14.3	30	6 6 48.68	6.744	24 51 1.6	1.26	3 34.8
31	4 46 39.54	6.560	23 48 30.2	11.50	4 13.0	31	6 9 30.58	6.745	24 50 26.1	1.00	3 33.5
32	4 49 17.13	6.571	+23 53 1.3	11.10	4 11.6	32	6 12 12.48	6.746	+24 49 40.2	2.12	3 31.3
Day of the Month,						Day of the Month,					
Polar Semidiameter						Polar Semidiameter,					
Horizontal Parallax						Horizontal Parallax,					
6th.						7th.					
14th.						15th.					
22d.						23d.					
30th.											
3.2						2.7					
3.1						2.6					
3.0						2.5					
5.5						4.6					
5.2						4.5					
5.0						4.3					
4.8											

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	6 9 30.58	6-745	+24 50 26.1	1-09	3 33.5	1	7 32 38.38	6-618	+23 6 12.4	14-89	2 54.6
2	6 12 12.48	6-745	24 49 40.2	2-13	3 32.3	2	7 35 17.06	6-610	23 0 10.3	15-39	2 53.3
3	6 14 54.38	6-746	24 48 43.8	3-07	3 31.1	3	7 37 55.54	6-601	22 53 58.6	16-39	2 52.0
4	6 17 36.28	6-746	24 47 36.8	3-01	3 29.9	4	7 40 33.81	6-592	22 47 37.4	16-06	2 50.7
5	6 20 18.16	6-745	24 46 19.1	3-45	3 28.6	5	7 43 11.97	6-583	22 41 6.8	16-47	2 49.4
6	6 23 0.01	6-744	24 44 50.8	3-39	3 27.3	6	7 45 49.72	6-574	22 34 26.8	16-58	2 48.1
7	6 25 41.83	6-742	24 43 12.0	4-23	3 26.1	7	7 48 27.36	6-565	22 27 37.5	17-25	2 46.8
8	6 28 23.60	6-740	24 41 22.6	4-77	3 24.9	8	7 51 4.79	6-556	22 20 38.8	17-64	2 45.5
9	6 31 5.33	6-738	24 39 22.5	5-21	3 23.7	9	7 53 42.01	6-547	22 13 30.9	18-03	2 44.2
10	6 33 47.01	6-736	24 37 12.0	5-55	3 22.4	10	7 56 19.01	6-537	22 6 13.9	18-39	2 42.9
11	6 36 28.64	6-734	24 34 51.2	6-09	3 21.1	11	7 58 55.79	6-527	21 58 47.9	18-77	2 41.6
12	6 39 10.23	6-732	24 32 20.2	6-52	3 19.9	12	8 1 32.35	6-517	21 51 12.7	19-15	2 40.2
13	6 41 51.77	6-730	24 29 38.9	6-56	3 18.7	13	8 4 8.67	6-507	21 53 28.5	19-52	2 38.8
14	6 44 33.25	6-728	24 26 47.2	7-38	3 17.5	14	8 6 44.76	6-497	21 35 35.3	19-59	2 37.5
15	6 47 14.63	6-724	24 23 45.1	7-51	3 16.3	15	8 9 20.60	6-487	21 27 33.2	20-26	2 36.2
16	6 49 55.91	6-720	24 20 32.6	8-24	3 15.1	16	8 11 56.21	6-477	21 19 22.4	20-52	2 34.9
17	6 52 37.09	6-716	24 17 9.7	8-58	3 13.8	17	8 14 31.59	6-467	21 11 3.1	20-58	2 33.5
18	6 55 18.18	6-712	24 13 36.2	9-11	3 12.5	18	8 17 6.73	6-457	21 2 35.3	21-24	2 32.1
19	6 57 59.16	6-707	24 9 52.3	9-54	3 11.2	19	8 19 41.63	6-447	20 53 59.1	21-59	2 30.8
20	7 0 40.00	6-702	24 5 58.1	9-57	3 10.0	20	8 22 16.29	6-437	20 45 14.5	22-04	2 29.5
21	7 3 20.72	6-697	24 1 53.8	10-30	3 8.7	21	8 24 50.72	6-427	20 36 21.5	22-28	2 28.1
22	7 6 1.30	6-692	23 57 39.4	10-51	3 7.4	22	8 27 24.90	6-417	20 27 20.1	22-72	2 26.7
23	7 8 41.75	6-686	23 53 15.0	11-22	3 6.1	23	8 29 58.80	6-407	20 18 10.5	22-06	2 25.3
24	7 11 22.06	6-679	23 48 40.6	11-54	3 4.8	24	8 32 32.42	6-396	20 8 52.8	22-40	2 23.9
25	7 14 2.22	6-672	23 43 56.3	12-05	3 3.6	25	8 35 5.78	6-386	19 59 27.0	22-74	2 22.5
26	7 16 42.21	6-666	23 39 2.1	12-46	3 2.3	26	8 37 38.88	6-374	19 49 53.1	24-07	2 21.1
27	7 19 22.03	6-659	23 33 58.1	12-57	3 1.0	27	8 40 11.71	6-363	19 40 11.3	24-40	2 19.7
28	7 22 1.67	6-650	23 28 44.3	13-27	2 59.7	28	8 42 44.29	6-352	19 30 21.8	24-72	2 18.3
29	7 24 41.14	6-642	23 23 20.8	13-58	2 58.4	29	8 45 16.60	6-341	19 20 24.6	25-04	2 16.9
30	7 27 20.42	6-634	23 17 47.7	14-08	2 57.2	30	8 47 48.65	6-330	19 10 19.8	25-36	2 15.5
31	7 29 59.50	6-626	23 12 4.9	14-49	2 55.9	31	8 50 20.44	6-319	19 0 7.4	26-07	2 14.1
32	7 32 38.38	6-618	+23 6 12.4	14-50	2 54.6	32	8 52 51.98	6-308	+18 49 47.5	26-38	2 12.7
Day of the Month,						Day of the Month,					
1st.						3d.					
9th.						10th.					
17th.						18th.					
25th.						26th.					
Polar Semidiameter						Polar Semidiameter					
Horizontal Parallax						Horizontal Parallax					
2.5						2.2					
2.4						2.2					
2.3						2.1					
3.9						3.6					
3.9						3.5					

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	8 50 20.44	6.319	+19 0 7.4	28.87	2 14.1	1	10 6 47.42	6.027	+12 47 59.5	33.77	1 28.3
2	8 52 51.98	6.308	18 49 47.5	28.98	2 12.7	2	10 9 11.97	6.019	12 34 26.5	33.98	1 26.8
3	8 55 23.25	6.297	18 39 20.1	29.29	2 11.2	3	10 11 36.33	6.011	12 20 48.6	34.18	1 25.3
4	8 57 54.27	6.286	18 28 45.2	29.60	2 9.8	4	10 14 0.51	6.004	12 7 5.8	34.38	1 23.8
5	9 0 25.03	6.275	18 18 3.0	29.91	2 8.3	5	10 16 24.51	6.007	11 53 18.2	34.58	1 22.2
6	9 2 55.52	6.264	18 7 13.4	27.22	2 6.9	6	10 18 48.36	6.001	11 39 25.9	34.77	1 20.6
7	9 5 25.75	6.254	17 56 16.6	27.52	2 5.5	7	10 21 12.07	6.005	11 25 29.0	34.95	1 19.1
8	9 7 55.75	6.244	17 45 12.8	27.80	2 4.1	8	10 23 35.64	6.079	11 11 27.5	35.15	1 17.6
9	9 10 25.52	6.233	17 34 2.2	28.08	2 2.7	9	10 25 59.08	6.072	10 57 21.6	35.33	1 16.0
10	9 12 55.06	6.223	17 22 44.7	28.37	2 1.2	10	10 28 22.38	6.066	10 43 11.5	35.51	1 14.4
11	9 15 24.36	6.213	17 11 20.3	28.65	1 59.7	11	10 30 45.55	6.062	10 28 57.2	35.69	1 12.8
12	9 17 53.43	6.203	16 59 49.1	28.94	1 58.2	12	10 33 8.58	6.067	10 14 38.6	35.86	1 11.3
13	9 20 22.27	6.197	16 48 11.2	29.22	1 56.8	13	10 35 31.48	6.062	10 0 15.9	36.03	1 9.8
14	9 22 50.89	6.187	16 36 26.6	29.50	1 55.3	14	10 37 54.25	6.047	9 45 49.3	36.19	1 8.2
15	9 25 19.28	6.178	16 24 35.5	29.77	1 53.8	15	10 40 16.90	6.042	9 31 18.9	36.35	1 6.6
16	9 27 47.44	6.168	16 12 38.0	30.03	1 52.3	16	10 42 39.43	6.037	9 16 44.7	36.50	1 5.0
17	9 30 15.37	6.159	16 0 34.3	30.29	1 50.8	17	10 45 1.85	6.032	9 2 6.7	36.65	1 3.5
18	9 32 43.06	6.149	15 48 24.5	30.55	1 49.4	18	10 47 24.17	6.028	8 47 25.2	36.80	1 2.0
19	9 35 10.51	6.139	15 36 8.4	30.80	1 47.9	19	10 49 46.40	6.024	8 32 40.2	36.94	1 0.4
20	9 37 37.72	6.129	15 23 46.2	31.05	1 46.4	20	10 52 8.54	6.020	8 17 51.8	37.08	0 58.8
21	9 40 4.70	6.119	15 11 17.9	31.30	1 44.9	21	10 54 30.58	6.016	8 3 0.1	37.22	0 57.2
22	9 42 31.45	6.109	14 58 43.7	31.54	1 43.4	22	10 56 52.53	6.012	7 48 5.1	37.35	0 55.7
23	9 44 57.96	6.100	14 46 3.9	31.78	1 41.9	23	10 59 14.39	6.010	7 33 6.9	37.48	0 54.1
24	9 47 24.25	6.091	14 33 18.4	32.02	1 40.4	24	11 1 36.18	6.007	7 18 5.7	37.60	0 52.5
25	9 49 50.33	6.083	14 20 27.3	32.25	1 38.8	25	11 3 57.91	6.004	7 3 1.5	37.73	0 50.9
26	9 52 16.21	6.075	14 7 30.8	32.48	1 37.4	26	11 6 19.59	6.002	6 47 54.5	37.85	0 49.3
27	9 54 41.89	6.068	13 54 28.7	32.72	1 35.9	27	11 8 41.22	6.000	6 32 44.6	37.97	0 47.8
28	9 57 7.37	6.060	13 41 21.2	32.94	1 34.4	28	11 11 2.81	6.006	6 17 32.1	38.08	0 46.2
29	9 59 32.66	6.050	13 28 8.4	33.15	1 32.9	29	11 13 24.35	6.003	6 2 17.0	38.19	0 44.6
30	10 1 57.76	6.042	13 24 50.5	33.36	1 31.4	30	11 15 45.84	6.005	5 46 59.1	38.29	0 43.0
31	10 4 22.68	6.033	13 1 27.5	33.56	1 29.9	31	11 18 7.29	6.004	5 31 38.7	38.40	0 41.4
32	10 6 47.42	6.027	+12 47 59.5	33.77	1 28.3	32	11 20 28.69	6.003	+ 5 16 16.0	38.50	0 39.9
Day of the Month,						Day of the Month,					
Polar Semidiameter						Polar Semidiameter					
Horizontal Parallax						Horizontal Parallax					
2.1 2.0 2.0 2.0						2.0 1.9 1.9 1.9					
3.5 3.4 3.4 3.4						3.3 3.3 3.3 3.3					

GREENWICH MEAN TIME

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m		^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m
1	11 20 28.69	5.893	+ 5 16 16.0	38.80	0 39.9	1	12 31 33.28	5.992	- 2 36 20.5	39.08	23 51.0
2	11 22 50.07	5.892	5 0 51.0	38.60	0 38.3	2	12 33 57.18	6.000	2 52 12.7	39.06	23 49.4
3	11 25 11.47	5.892	4 45 23.6	38.00	0 36.7	3	12 36 21.28	6.009	3 8 4.2	39.03	23 47.9
4	11 27 32.88	5.892	4 29 54.0	38.78	0 35.1	4	12 38 45.59	6.019	3 23 55.0	39.00	23 46.5
5	11 29 54.31	5.893	4 14 22.4	38.86	0 33.5	5	12 41 10.12	6.027	3 39 45.0	39.07	23 45.0
6	11 32 15.76	5.894	3 58 48.8	38.94	0 32.0	6	12 43 34.87	6.036	3 55 34.2	39.04	23 43.4
7	11 34 37.22	5.895	3 43 13.3	39.02	0 30.4	7	12 45 59.83	6.045	4 11 22.6	39.00	23 41.9
8	11 36 58.70	5.896	3 27 36.0	39.10	0 28.8	8	12 48 25.01	6.053	4 27 9.9	39.05	23 40.4
9	11 39 20.22	5.897	3 11 56.9	39.17	0 27.2	9	12 50 50.42	6.064	4 42 55.9	39.09	23 38.9
10	11 41 41.78	5.899	2 56 16.1	39.23	0 25.6	10	12 53 16.07	6.074	4 58 40.6	39.23	23 37.4
11	11 44 3.38	5.901	2 40 33.9	39.29	0 24.1	11	12 55 41.97	6.084	5 14 24.0	39.27	23 35.9
12	11 46 25.04	5.903	2 24 50.3	39.35	0 22.5	12	12 58 8.13	6.095	5 30 5.8	39.21	23 34.4
13	11 48 46.76	5.906	2 9 5.3	39.40	0 20.9	13	13 0 34.54	6.106	5 45 45.9	39.14	23 32.9
14	11 51 8.54	5.908	1 53 19.1	39.45	0 19.3	14	13 3 1.21	6.117	6 1 24.3	39.06	23 31.4
15	11 53 30.38	5.911	1 37 31.8	39.50	0 17.7	15	13 5 23.14	6.128	6 17 0.9	39.06	23 29.9
16	11 55 52.28	5.913	1 21 43.5	39.54	0 16.2	16	13 7 55.34	6.140	6 32 35.5	39.00	23 28.4
17	11 58 14.23	5.916	1 5 54.2	39.57	0 14.6	17	13 10 22.82	6.151	6 48 8.0	39.01	23 26.9
18	12 0 36.25	5.919	0 50 4.1	39.60	0 13.0	18	13 12 50.59	6.163	7 3 38.3	39.11	23 25.4
19	12 2 58.35	5.923	0 34 13.2	39.62	0 11.4	19	13 15 18.63	6.175	7 19 6.2	39.01	23 23.9
20	12 5 20.56	5.927	0 18 21.7	39.65	0 9.8	20	13 17 46.96	6.187	7 34 31.7	39.01	23 22.5
21	12 7 42.88	5.932	+ 0 2 29.7	39.68	0 8.3	21	13 20 15.60	6.200	7 49 54.7	39.40	23 21.1
22	12 10 5.31	5.937	- 0 13 22.8	39.70	0 6.7	22	13 22 44.56	6.213	8 5 15.0	39.29	23 19.6
23	12 12 27.85	5.942	0 29 15.7	39.71	0 5.1	23	13 25 13.82	6.226	8 20 32.6	39.17	23 18.1
24	12 14 50.52	5.947	0 35 8.8	39.72	0 3.5	24	13 27 43.40	6.240	8 35 47.3	39.05	23 16.7
25	12 17 13.32	5.953	1 1 2.0	39.73	0 1.9	25	13 30 13.32	6.254	8 50 58.9	37.92	23 15.3
26	12 19 36.26	5.959	1 16 55.4	39.73	$\frac{0}{25} \frac{0.4}{58.9}$	26	13 32 43.58	6.268	9 6 7.5	37.79	23 13.9
27	12 21 59.36	5.965	1 32 48.7	39.73	23 57.3	27	13 35 14.18	6.282	9 21 13.0	37.66	23 12.4
28	12 24 22.62	5.971	1 48 41.8	39.73	23 55.7	28	13 37 45.13	6.297	9 36 15.2	37.52	23 11.0
29	12 26 46.01	5.978	2 4 34.9	39.71	23 54.2	29	13 40 16.44	6.312	9 51 13.9	37.38	23 9.6
30	12 29 9.56	5.985	2 20 27.8	39.70	23 52.6	30	13 42 48.13	6.327	10 6 9.1	37.23	23 8.2
31	12 31 33.28	5.992	2 36 20.5	39.68	23 51.0	31	13 45 20.19	6.343	10 21 0.6	37.07	23 6.8
32	12 33 57.18	6.000	- 2 52 12.7	39.66	23 49.4	32	13 47 52.63	6.359	-10 35 48.3	36.91	23 5.4
Day of the Month,						Day of the Month,					
		6th.	14th.	22d.	30th.			6th.	16th.	24th.	
Polar Semidiameter		1.9	1.9	1.9	1.9	Polar Semidiameter,		1.9	1.9	1.9	
Horizontal Parallax		3.3	3.3	3.3	3.3	Horizontal Parallax,		3.3	3.3	3.3	

GREENWICH MEAN TIME.

NOVEMBER.

DECEMBER.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	
	Noon.			Noon.	Noon.			Noon.		
	h	m	s	s	°	'	"	"	h	m
1	13	47	52.63	6-269	-10	35	48.3	36-91	23	5.4
2	13	50	25.46	6-276	10	50	32.1	36-76	23	4.0
3	13	52	58.69	6-288	11	5	12.0	36-56	23	2.6
4	13	55	32.32	6-410	11	19	47.7	36-40	23	1.2
5	13	58	6.35	6-437	11	34	19.1	36-22	22	59.9
6	14	0	40.79	6-444	11	48	46.1	36-08	22	58.5
7	14	3	15.65	6-461	12	3	8.5	35-84	22	57.1
8	14	5	50.94	6-479	12	17	26.3	35-66	22	55.8
9	14	8	26.66	6-497	12	31	39.4	35-44	22	54.5
10	14	11	2.81	6-515	12	45	47.5	35-28	22	53.2
11	14	13	39.38	6-533	12	59	50.4	35-01	22	51.9
12	14	16	16.39	6-551	13	13	48.1	34-79	22	50.6
13	14	18	53.84	6-569	13	27	40.5	34-56	22	49.3
14	14	21	31.73	6-586	13	41	27.5	34-33	22	48.0
15	14	24	10.06	6-606	13	55	8.9	34-09	22	46.7
16	14	26	48.84	6-625	13	8	44.5	33-85	22	45.4
17	14	29	28.08	6-644	14	22	14.2	33-60	22	44.1
18	14	32	7.77	6-663	14	35	37.9	33-35	22	42.8
19	14	34	47.93	6-682	14	48	55.4	33-09	22	41.5
20	14	37	28.55	6-702	15	2	6.6	32-83	22	40.3
21	14	40	9.63	6-722	15	15	11.4	32-56	22	39.0
22	14	42	51.19	6-742	15	28	9.7	32-29	22	37.7
23	14	45	33.23	6-762	15	41	1.4	32-01	22	36.5
24	14	48	15.76	6-782	15	53	46.3	31-73	22	35.3
25	14	50	58.78	6-802	16	6	24.4	31-43	22	34.1
26	14	53	42.29	6-822	16	18	55.3	31-13	22	32.9
27	14	56	26.31	6-842	16	31	18.8	30-83	22	31.7
28	14	59	10.83	6-863	16	43	34.9	30-52	22	30.5
29	15	1	55.86	6-886	16	55	43.6	30-21	22	29.3
30	15	4	41.40	6-906	17	7	44.8	29-89	22	28.1
31	15	7	27.45	6-929	17	19	38.2	29-56	22	26.9
32	15	10	14.01	6-951	-17	31	23.8	29-23	22	25.7

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	
	Noon.			Noon.	Noon.			Noon.		
	h	m	s	s	°	'	"	"	h	m
1	15	7	27.45	6-929	-17	19	38.2	29-56	22	26.9
2	15	10	14.01	6-951	17	31	23.8	29-23	22	25.7
3	15	13	1.09	6-972	17	43	1.4	28-99	22	24.6
4	15	15	48.69	6-994	17	54	30.7	28-55	22	23.5
5	15	18	36.81	7-016	18	5	51.7	28-30	22	22.4
6	15	21	25.44	7-037	18	17	4.2	28-84	22	21.3
7	15	24	14.60	7-058	18	28	8.0	28-48	22	20.2
8	15	27	4.28	7-080	18	39	3.1	27-11	22	19.1
9	15	29	54.48	7-101	18	49	49.4	26-74	22	18.0
10	15	32	45.18	7-122	19	0	26.6	26-36	22	16.9
11	15	35	36.39	7-144	19	10	54.7	25-97	22	15.8
12	15	38	28.12	7-166	19	21	13.4	25-58	22	14.7
13	15	41	20.36	7-187	19	31	22.6	25-18	22	13.6
14	15	44	13.10	7-209	19	41	22.1	24-78	22	12.5
15	15	47	6.35	7-230	19	51	11.9	24-37	22	11.5
16	15	50	0.10	7-251	20	0	51.9	23-96	22	10.4
17	15	52	54.35	7-272	20	10	21.9	23-54	22	9.4
18	15	55	49.09	7-293	20	19	41.7	23-11	22	8.4
19	15	58	44.33	7-313	20	28	51.1	22-68	22	7.4
20	16	1	40.07	7-333	20	37	50.1	22-26	22	6.4
21	16	4	36.31	7-354	20	46	38.6	21-80	22	5.4
22	16	7	33.03	7-374	20	55	16.4	21-36	22	4.4
23	16	10	30.25	7-394	21	3	43.5	20-89	22	3.4
24	16	13	27.95	7-414	21	11	59.6	20-43	22	2.4
25	16	16	26.14	7-434	21	20	4.4	19-97	22	1.5
26	16	19	24.81	7-454	21	27	58.0	19-50	22	0.5
27	16	22	23.97	7-474	21	35	40.5	19-03	21	59.5
28	16	25	23.60	7-494	21	43	11.7	18-56	21	58.6
29	16	28	23.71	7-514	21	50	31.3	18-07	21	57.7
30	16	31	24.28	7-534	21	57	38.9	17-58	21	56.8
31	16	34	25.31	7-553	22	4	34.7	17-08	21	55.9
32	16	37	26.80	7-572	-22	11	18.6	16-58	21	55.0

Day of the Month,	1st.	9th.	17th.	25th.
Polar Semidiameter	2.0	2.0	2.0	2.0
Horizontal Parallax	3.3	3.4	3.4	3.5

Day of the Month,	3d.	11th.	19th.	27th.
Polar Semidiameter	2.1	2.1	2.1	2.2
Horizontal Parallax	3.5	3.6	3.6	3.7

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m		^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m
1	13 34 2.19	1.106	8 27 26.0	6.89	18 48.7	1	13 43 1.25	0.203	9 11 41.6	1.09	16 55.5
2	13 34 28.51	1.064	8 29 47.4	6.76	18 45.2	2	13 43 8.18	0.274	9 12 5.7	0.92	16 51.7
3	13 34 54.27	1.023	8 32 3.8	6.62	18 41.7	3	13 43 14.41	0.245	9 12 25.8	0.78	16 47.9
4	13 35 19.50	1.040	8 34 16.9	6.48	18 38.2	4	13 43 19.94	0.216	9 12 41.9	0.69	16 44.0
5	13 35 44.18	1.017	8 36 26.7	6.33	18 34.7	5	13 43 24.77	0.186	9 12 54.1	0.42	16 40.1
6	13 36 8.32	0.994	8 38 33.0	6.19	18 31.2	6	13 43 28.68	0.156	9 13 2.2	0.26	16 36.3
7	13 36 31.90	0.970	8 40 35.8	6.04	18 27.6	7	13 43 32.28	0.126	9 13 6.3	0.09	16 32.4
8	13 36 54.91	0.947	8 42 35.2	4.90	18 24.0	8	13 43 34.97	0.097	9 13 6.3	+0.08	16 28.5
9	13 37 17.36	0.923	8 44 31.0	4.75	18 20.4	9	13 43 36.94	0.067	9 13 2.3	0.25	16 24.6
10	13 37 39.23	0.899	8 46 23.3	4.60	18 16.8	10	13 43 38.19	0.037	9 12 54.2	0.42	16 20.7
11	13 38 0.52	0.874	8 48 11.9	4.45	18 13.3	11	13 43 38.72	+0.007	9 12 42.1	0.68	16 16.8
12	13 38 21.22	0.850	8 49 57.0	4.30	18 9.7	12	13 43 38.54	-0.023	9 12 25.9	0.75	16 12.8
13	13 38 41.32	0.826	8 51 38.4	4.15	18 6.1	13	13 43 37.62	0.053	9 12 5.7	0.83	16 8.8
14	13 39 0.82	0.799	8 53 16.2	3.99	18 2.5	14	13 43 35.99	0.023	9 11 41.4	1.09	16 4.9
15	13 39 19.71	0.774	8 54 50.1	3.83	17 58.8	15	13 43 33.63	0.113	9 11 13.1	1.26	16 0.9
16	13 39 37.98	0.748	8 56 20.4	3.68	17 55.1	16	13 43 30.55	0.143	9 10 40.7	1.43	15 56.9
17	13 39 55.61	0.722	8 57 47.0	3.53	17 51.5	17	13 43 26.75	0.173	9 10 4.4	1.60	15 52.9
18	13 40 12.61	0.696	8 59 9.8	3.37	17 47.8	18	13 43 22.23	0.203	9 9 24.0	1.76	15 48.9
19	13 40 23.97	0.668	9 0 28.7	3.20	17 44.2	19	13 43 17.00	0.233	9 8 39.7	1.92	15 44.9
20	13 40 44.69	0.641	9 1 43.8	3.05	17 40.5	20	13 43 11.05	0.263	9 7 51.5	2.09	15 40.9
21	13 40 59.76	0.614	9 2 55.0	2.89	17 36.8	21	13 43 4.39	0.293	9 6 59.3	2.25	15 36.8
22	13 41 14.17	0.586	9 4 2.4	2.73	17 33.1	22	13 42 57.02	0.321	9 6 3.2	2.41	15 32.7
23	13 41 27.92	0.559	9 5 6.0	2.56	17 29.4	23	13 42 48.95	0.350	9 5 3.3	2.57	15 28.7
24	13 41 41.00	0.531	9 6 5.6	2.40	17 25.7	24	13 42 40.19	0.379	9 3 59.6	2.73	15 24.6
25	13 41 53.41	0.503	9 7 1.3	2.24	17 22.0	25	13 42 30.74	0.407	9 2 52.0	2.89	15 20.5
26	13 42 5.15	0.475	9 7 53.2	2.08	17 18.3	26	13 42 20.60	0.436	9 1 40.7	3.05	15 16.4
27	13 42 16.21	0.446	9 8 41.1	1.91	17 14.5	27	13 42 9.79	0.464	9 0 25.6	3.20	15 12.3
28	13 42 26.59	0.419	9 9 25.1	1.75	17 10.7	28	13 41 58.30	0.492	8 59 6.8	3.36	15 8.1
29	13 42 36.29	0.390	9 10 5.2	1.59	17 6.9	29	13 41 46.14	0.520	8 57 44.3	3.51	15 4.0
30	13 42 45.30	0.361	9 10 41.3	1.42	17 3.1	30	13 41 33.33	0.547	8 56 18.2	3.66	14 59.8
31	13 42 53.62	0.332	9 11 13.4	1.25	16 59.3	31	13 41 19.86	0.574	8 54 48.6	3.80	14 55.7
32	13 43 1.25	0.303	9 11 41.6	1.09	16 55.5	32	13 41 5.75	0.601	8 53 15.4	3.95	14 51.5
Day of the Month,						Day of the Month,					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		16.5	17.1	17.6	18.2	Polar Semidiameter		18.2	18.7	19.3	19.8
Horizontal Parallax		1.5	1.6	1.6	1.7	Horizontal Parallax		1.7	1.7	1.8	1.8

GREENWICH MEAN TIME.

MARCH.

APRIL.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.		Apparent Declination.			Var. of Dec. for 1 Hour.		Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.		Apparent Declination.			Var. of Dec. for 1 Hour.		Meridian Passage.
	Noon.			Noon.		Noon.			Noon.				Noon.			Noon.		Noon.			Noon.		
	h	m	s	"	'	"	°	'	"	"			h	m	s	"	'	"	°	'	"	"	
1	13	41	46.14	0.520	-	8	57	44.3	3.51	15	4.0	1	13	30	52.96	1.142	-	7	50	11.7	6.84	12	51.1
2	13	41	33.33	0.547		8	56	18.2	3.66	14	59.8	2	13	30	25.43	1.151		7	47	26.9	6.88	12	46.7
3	13	41	19.86	0.574		8	54	48.6	3.80	14	55.7	3	13	29	57.68	1.160		7	44	41.1	6.92	12	42.3
4	13	41	5.75	0.601		8	53	15.4	3.95	14	51.5	4	13	29	29.74	1.167		7	41	54.4	6.96	12	37.9
5	13	40	51.01	0.627		8	51	38.8	4.09	14	47.3	5	13	29	1.63	1.174		7	39	6.9	6.99	12	33.5
6	13	40	35.64	0.653		8	49	58.7	4.24	14	43.1	6	13	28	33.35	1.181		7	36	18.7	7.02	12	29.1
7	13	40	19.65	0.679		8	48	15.3	4.37	14	38.9	7	13	28	4.94	1.186		7	33	29.9	7.04	12	24.7
8	13	40	3.04	0.704		8	46	28.6	4.51	14	34.7	8	13	27	36.41	1.191		7	30	40.6	7.06	12	20.3
9	13	39	45.83	0.729		8	44	38.6	4.65	14	30.5	9	13	27	7.77	1.194		7	27	50.9	7.08	12	15.9
10	13	39	23.03	0.753		8	42	45.3	4.78	14	26.2	10	13	26	39.06	1.197		7	25	1.0	7.09	12	11.5
11	13	39	9.65	0.777		8	40	48.8	4.91	14	22.0	11	13	26	10.28	1.200		7	22	11.1	7.09	12	7.1
12	13	38	50.69	0.801		8	38	49.2	5.04	14	17.8	12	13	25	41.46	1.201		7	19	21.2	7.09	12	2.7
13	13	38	31.17	0.824		8	36	46.5	5.17	14	13.5	13	13	25	12.62	1.201		7	16	31.4	7.07	11	58.3
14	13	38	11.10	0.847		8	34	40.9	5.29	14	9.2	14	13	24	43.79	1.201		7	13	41.9	7.06	11	53.9
15	13	37	50.50	0.869		8	32	32.4	5.41	14	5.0	15	13	24	14.97	1.200		7	10	52.7	7.04	11	49.5
16	13	37	29.37	0.891		8	30	21.1	5.53	14	0.7	16	13	23	46.19	1.197		7	8	4.0	7.02	11	45.1
17	13	37	7.73	0.913		8	28	7.1	5.64	13	56.4	17	13	23	17.47	1.194		7	5	15.9	6.99	11	40.7
18	13	36	45.59	0.932		8	25	50.4	5.76	13	52.1	18	13	22	48.84	1.190		7	2	28.6	6.96	11	36.3
19	13	36	22.97	0.952		8	23	31.1	5.86	13	47.7	19	13	22	20.31	1.186		6	59	42.2	6.91	11	31.9
20	13	35	59.89	0.971		8	21	9.4	5.96	13	43.4	20	13	21	51.91	1.180		6	56	56.8	6.86	11	27.5
21	13	35	36.36	0.989		8	18	45.3	6.04	13	39.1	21	13	21	23.65	1.173		6	54	12.5	6.81	11	23.1
22	13	35	12.40	1.006		8	16	18.8	6.14	13	34.8	22	13	20	55.57	1.166		6	51	29.5	6.76	11	18.7
23	13	34	48.03	1.022		8	13	50.2	6.23	13	30.4	23	13	20	27.67	1.158		6	48	47.9	6.70	11	14.3
24	13	34	23.26	1.040		8	11	19.6	6.31	13	26.1	24	13	19	59.97	1.149		6	46	7.7	6.64	11	9.9
25	13	33	58.11	1.056		8	8	47.0	6.40	13	21.8	25	13	19	32.50	1.139		6	43	29.1	6.57	11	5.5
26	13	33	32.59	1.070		8	6	12.4	6.48	13	17.4	26	13	19	5.27	1.129		6	40	52.2	6.50	11	1.1
27	13	33	6.73	1.084		8	3	36.1	6.56	13	13.0	27	13	18	38.30	1.118		6	38	17.1	6.42	10	56.7
28	13	32	40.55	1.097		8	0	58.1	6.61	13	8.7	28	13	18	11.61	1.106		6	35	43.9	6.33	10	52.4
29	13	32	14.07	1.109		7	58	18.6	6.67	13	4.3	29	13	17	45.22	1.094		6	33	12.7	6.26	10	48.0
30	13	31	47.30	1.121		7	55	37.6	6.72	12	59.9	30	13	17	19.14	1.080		6	30	43.6	6.16	10	43.6
31	13	31	20.26	1.129		7	52	55.3	6.78	12	55.5	31	13	16	53.38	1.066		6	28	16.7	6.07	10	39.3
32	13	30	52.96	1.142	-	7	50	11.7	6.84	12	51.1	32	13	16	27.96	1.051	-	6	25	52.2	5.97	10	34.9

Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	19.7	20.1	20.5	20.8
Horizontal Parallax	1.8	1.9	1.9	1.9

Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	20.8	20.9	20.9	20.7
Horizontal Parallax	1.9	1.9	1.9	1.9

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	13 16 53.38	1.086	6 28 16.7	6.07	10 39.3	1	13 7 29.86	0.380	5 37 56.8	1.68	8 28.1
2	13 16 27.96	1.081	6 25 52.2	6.97	10 34.9	2	13 7 21.04	0.354	5 37 19.2	1.48	8 24.0
3	13 16 2.91	1.086	6 23 30.0	6.87	10 30.6	3	13 7 12.87	0.337	5 36 45.7	1.31	8 20.0
4	13 15 38.23	1.090	6 21 10.3	6.76	10 26.2	4	13 7 5.35	0.399	5 36 16.3	1.13	8 16.0
5	13 15 13.93	1.004	6 18 53.2	6.66	10 21.9	5	13 6 58.49	0.373	5 35 51.1	0.96	8 11.9
6	13 14 50.03	0.997	6 16 38.7	6.54	10 17.6	6	13 6 52.28	0.245	5 35 30.0	0.79	8 7.9
7	13 14 26.55	0.967	6 14 27.0	6.43	10 13.3	7	13 6 46.74	0.217	5 35 13.1	0.62	8 3.9
8	13 14 3.50	0.981	6 12 18.1	6.32	10 9.0	8	13 6 41.86	0.189	5 35 0.3	0.44	7 59.9
9	13 13 40.89	0.982	6 10 12.1	6.19	10 4.7	9	13 6 37.65	0.161	5 34 51.7	0.27	7 55.9
10	13 13 18.74	0.918	6 8 9.1	6.06	10 0.4	10	13 6 34.10	0.134	5 34 47.2	+0.10	7 51.9
11	13 12 57.06	0.893	6 6 9.2	4.98	9 56.1	11	13 6 31.22	0.106	5 34 46.9	-0.07	7 47.9
12	13 12 35.86	0.872	6 4 12.5	4.80	9 51.8	12	13 6 29.01	0.078	5 34 50.8	0.24	7 43.9
13	13 12 15.15	0.882	6 2 19.0	4.66	9 47.5	13	13 6 27.47	0.060	5 34 58.8	0.42	7 39.9
14	13 11 54.95	0.880	6 0 28.9	4.61	9 43.2	14	13 6 26.59	-0.023	5 35 11.0	0.60	7 36.0
15	13 11 35.28	0.808	5 58 42.1	4.37	9 39.0	15	13 6 26.39	+0.006	5 35 27.4	0.77	7 32.1
16	13 11 16.14	0.786	5 56 58.7	4.28	9 34.8	16	13 6 26.86	0.033	5 35 48.0	0.94	7 28.2
17	13 10 57.54	0.768	5 55 18.8	4.09	9 30.5	17	13 6 28.01	0.061	5 36 12.7	1.11	7 24.3
18	13 10 39.50	0.740	5 53 42.5	3.98	9 26.3	18	13 6 29.82	0.089	5 36 41.6	1.28	7 20.4
19	13 10 22.02	0.716	5 52 9.9	3.78	9 22.1	19	13 6 32.30	0.117	5 37 14.6	1.46	7 16.5
20	13 10 5.11	0.692	5 50 41.0	3.68	9 17.9	20	13 6 35.45	0.145	5 37 51.7	1.63	7 12.6
21	13 9 48.79	0.667	5 49 15.8	3.47	9 13.7	21	13 6 39.27	0.173	5 38 32.8	1.79	7 8.7
22	13 9 33.07	0.643	5 47 54.4	3.31	9 9.5	22	13 6 43.75	0.200	5 39 18.0	1.96	7 4.9
23	13 9 17.95	0.617	5 46 36.9	3.14	9 5.3	23	13 6 48.88	0.227	5 40 7.2	2.13	7 1.1
24	13 9 3.44	0.692	5 45 23.3	2.98	9 1.1	24	13 6 54.67	0.255	5 41 0.5	2.30	6 57.2
25	13 8 49.54	0.666	5 44 13.5	2.82	8 56.9	25	13 7 1.12	0.282	5 41 57.7	2.46	6 53.4
26	13 8 36.26	0.540	5 43 7.7	2.66	8 52.8	26	13 7 8.21	0.309	5 42 58.9	2.63	6 49.6
27	13 8 23.61	0.614	5 42 5.9	2.49	8 48.7	27	13 7 15.95	0.336	5 44 4.0	2.79	6 45.8
28	13 8 11.58	0.488	5 41 8.0	2.33	8 44.5	28	13 7 24.33	0.362	5 45 12.9	2.96	6 42.0
29	13 8 0.19	0.461	5 40 14.1	2.16	8 40.4	29	13 7 33.35	0.388	5 46 25.7	3.11	6 38.2
30	13 7 49.44	0.434	5 39 24.3	1.99	8 36.3	30	13 7 43.00	0.414	5 47 42.3	3.27	6 34.4
31	13 7 39.33	0.407	5 38 38.5	1.83	8 32.2	31	13 7 53.27	0.441	5 49 2.8	3.43	6 30.7
32	13 7 29.86	0.380	5 37 56.8	1.68	8 28.1	32	13 8 4.17	0.467	5 50 27.0	3.58	6 27.0
Day of the Month,						Day of the Month,					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		20.7	20.4	20.0	19.5	Polar Semidiameter		19.5	19.0	18.4	17.9
Horizontal Parallax		1.9	1.9	1.8	1.8	Horizontal Parallax		1.8	1.8	1.7	1.7

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	13 7 53.27	0.441	5 49 2.8	3.43	6 30.7	1	13 18 1.38	1.100	6 58 59.2	7.58	4 38.9
2	13 8 4.17	0.487	5 50 27.0	3.58	6 27.0	2	13 18 29.47	1.180	7 2 2.6	7.60	4 35.4
3	13 8 15.69	0.498	5 51 55.0	3.74	6 23.2	3	13 18 58.03	1.199	7 5 8.6	7.80	4 32.0
4	13 8 27.83	0.519	5 53 26.7	3.99	6 19.5	4	13 19 27.05	1.218	7 8 17.1	7.90	4 28.5
5	13 8 40.59	0.544	5 55 2.0	4.04	6 15.8	5	13 19 56.53	1.238	7 11 28.1	8.00	4 25.1
6	13 8 53.95	0.569	5 56 41.0	4.20	6 12.1	6	13 20 26.47	1.257	7 14 41.5	8.10	4 21.7
7	13 9 7.92	0.594	5 58 23.6	4.35	6 8.4	7	13 20 56.87	1.276	7 17 57.3	8.20	4 18.3
8	13 9 22.49	0.619	6 0 9.8	4.50	6 4.7	8	13 21 27.72	1.294	7 21 15.5	8.30	4 14.9
9	13 9 37.66	0.644	6 1 59.6	4.58	6 1.0	9	13 21 59.00	1.313	7 24 36.0	8.40	4 11.5
10	13 9 53.43	0.669	6 3 52.9	4.79	5 57.3	10	13 22 30.73	1.331	7 27 58.8	8.49	4 8.1
11	13 10 9.79	0.694	6 5 49.6	4.93	5 53.6	11	13 23 2.89	1.340	7 31 23.8	8.58	4 4.7
12	13 10 26.74	0.718	6 7 49.8	5.08	5 50.0	12	13 23 35.47	1.366	7 34 50.9	8.66	4 1.3
13	13 10 44.27	0.743	6 9 53.5	5.23	5 46.4	13	13 24 8.48	1.384	7 38 20.3	8.76	3 57.9
14	13 11 2.37	0.768	6 12 0.5	5.38	5 42.8	14	13 24 41.91	1.401	7 41 51.8	8.85	3 54.5
15	13 11 21.05	0.790	6 14 10.9	5.50	5 39.2	15	13 25 15.76	1.419	7 45 25.3	8.98	3 51.1
16	13 11 40.31	0.814	6 16 24.6	5.64	5 35.5	16	13 25 50.01	1.438	7 49 0.8	9.02	3 47.8
17	13 12 0.13	0.837	6 18 41.6	5.77	5 31.9	17	13 26 24.66	1.451	7 52 38.3	9.10	3 44.5
18	13 12 20.51	0.860	6 21 1.9	5.91	5 28.3	18	13 26 59.71	1.467	7 56 17.8	9.18	3 41.1
19	13 12 41.44	0.888	6 23 25.3	6.04	5 24.8	19	13 27 35.15	1.483	7 59 59.2	9.26	3 37.7
20	13 13 2.99	0.906	6 25 51.8	6.17	5 21.2	20	13 28 10.98	1.500	8 3 42.4	9.34	3 34.4
21	13 13 24.95	0.929	6 28 21.4	6.30	5 17.6	21	13 28 47.19	1.516	8 7 27.4	9.41	3 31.1
22	13 13 47.52	0.951	6 30 54.1	6.43	5 14.0	22	13 29 23.76	1.531	8 11 14.2	9.48	3 27.7
23	13 14 10.62	0.973	6 33 29.8	6.55	5 10.5	23	13 30 0.70	1.547	8 15 2.7	9.55	3 24.4
24	13 14 34.24	0.996	6 36 8.5	6.67	5 7.0	24	13 30 38.01	1.562	8 18 52.9	9.62	3 21.1
25	13 14 58.38	1.016	6 38 50.1	6.79	5 3.5	25	13 31 15.67	1.576	8 22 44.7	9.69	3 17.8
26	13 15 23.03	1.037	6 41 34.5	6.91	4 59.9	26	13 31 53.68	1.590	8 26 38.1	9.75	3 14.5
27	13 15 48.19	1.058	6 44 21.8	7.03	4 56.4	27	13 32 32.03	1.605	8 30 33.0	9.81	3 11.2
28	13 16 13.85	1.079	6 47 11.9	7.14	4 52.9	28	13 33 10.73	1.619	8 34 29.4	9.88	3 7.9
29	13 16 40.00	1.100	6 50 4.7	7.26	4 49.4	29	13 33 49.77	1.633	8 38 27.3	9.94	3 4.6
30	13 17 6.65	1.120	6 53 0.2	7.38	4 45.9	30	13 34 29.14	1.647	8 42 26.6	10.00	3 1.3
31	13 17 33.77	1.140	6 55 58.4	7.47	4 42.4	31	13 35 8.83	1.660	8 46 27.4	10.06	2 58.0
32	13 19 1.38	1.160	6 58 59.2	7.58	4 38.9	32	13 35 48.84	1.674	8 50 29.5	10.12	2 54.8
Day of the Month,						Day of the Month,					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		17.9	17.4	16.9	16.4	Polar Semidiameter		16.4	16.0	15.6	15.3
Horizontal Parallax		1.7	1.6	1.6	1.5	Horizontal Parallax		1.5	1.5	1.4	1.4

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	13 35 48.84	1.674	8 50 29.5	10.12	2 54.8	1	13 57 57.47	1.986	11 59 1.1	11.07	1 18.9
2	13 36 29.18	1.687	8 54 33.0	10.17	2 51.5	2	13 58 45.23	1.998	11 3 26.9	11.08	1 15.7
3	13 37 9.83	1.700	8 58 37.8	10.22	2 48.2	3	13 59 33.18	2.000	11 7 52.8	11.08	1 12.6
4	13 37 50.80	1.712	9 2 43.8	10.27	2 45.0	4	14 0 21.30	2.008	11 12 18.9	11.09	1 9.5
5	13 38 32.07	1.725	9 6 51.0	10.32	2 41.7	5	14 1 9.59	2.016	11 16 45.1	11.09	1 6.4
6	13 39 13.64	1.738	9 10 59.3	10.37	2 38.5	6	14 1 58.05	2.023	11 21 11.5	11.10	1 3.2
7	13 39 55.51	1.750	9 15 8.8	10.42	2 35.3	7	14 2 46.68	2.028	11 25 37.9	11.10	1 0.1
8	13 40 37.63	1.763	9 19 19.5	10.47	2 32.1	8	14 3 35.46	2.035	11 30 4.3	11.09	0 57.0
9	13 41 20.14	1.775	9 23 31.3	10.51	2 28.8	9	14 4 24.39	2.041	11 34 30.6	11.09	0 53.8
10	13 42 2.88	1.787	9 27 44.1	10.56	2 25.6	10	14 5 13.47	2.047	11 38 56.9	11.09	0 50.7
11	13 42 45.91	1.798	9 31 57.9	10.59	2 22.4	11	14 6 2.69	2.053	11 43 23.1	11.09	0 47.6
12	13 43 23.21	1.809	9 36 12.6	10.63	2 19.2	12	14 6 52.05	2.058	11 47 49.3	11.08	0 44.5
13	13 44 12.78	1.820	9 50 23.3	10.67	2 16.0	13	14 7 41.54	2.063	11 52 15.3	11.08	0 41.4
14	13 44 56.62	1.831	9 44 44.8	10.70	2 12.8	14	14 8 31.16	2.068	11 56 41.1	11.07	0 38.3
15	13 45 40.71	1.842	9 49 2.2	10.74	2 9.6	15	14 9 20.90	2.073	12 1 6.7	11.06	0 35.2
16	13 46 25.06	1.853	9 53 20.3	10.77	2 6.4	16	14 10 10.75	2.078	12 5 32.1	11.06	0 32.1
17	13 47 9.66	1.863	9 57 39.1	10.80	2 3.2	17	14 11 0.72	2.083	12 9 57.1	11.06	0 29.0
18	13 47 54.51	1.873	10 1 58.7	10.83	2 0.0	18	14 11 50.79	2.088	12 14 21.7	11.01	0 25.9
19	13 48 39.59	1.883	10 6 19.0	10.86	1 56.8	19	14 12 40.96	2.092	12 18 46.0	11.00	0 22.8
20	13 49 24.91	1.893	10 10 39.9	10.88	1 53.6	20	14 13 31.23	2.096	12 23 9.9	10.99	0 19.7
21	13 50 10.46	1.902	10 15 1.4	10.90	1 50.5	21	14 14 21.59	2.100	12 27 33.4	10.97	0 16.6
22	13 50 56.23	1.911	10 19 23.4	10.93	1 47.3	22	14 15 12.04	2.103	12 31 56.4	10.95	0 13.5
23	13 51 42.22	1.920	10 23 46.0	10.95	1 44.1	23	14 16 2.57	2.106	12 36 19.0	10.93	0 10.4
24	13 52 28.42	1.927	10 28 9.0	10.97	1 41.0	24	14 16 53.17	2.110	12 40 41.0	10.90	0 7.3
25	13 53 14.83	1.936	10 32 32.5	10.99	1 37.8	25	14 17 43.85	2.113	12 45 2.5	10.88	0 4.2
26	13 54 1.45	1.945	10 36 56.4	11.00	1 34.6	26	14 18 34.60	2.116	12 49 23.4	10.86	0 1.1
27	13 54 48.26	1.954	10 41 20.7	11.02	1 31.5	27	14 19 25.40	2.117	12 53 43.8	10.83	23 54.9
28	13 55 35.27	1.962	10 45 45.4	11.03	1 28.3	28	14 20 16.27	2.120	12 58 3.5	10.80	23 51.9
29	13 56 22.48	1.970	10 50 10.4	11.04	1 25.2	29	14 21 7.20	2.123	13 2 22.6	10.78	23 48.8
30	13 57 9.88	1.978	10 54 35.6	11.05	1 22.0	30	14 21 58.18	2.126	13 6 41.0	10.75	23 45.7
31	13 57 57.47	1.985	10 59 1.1	11.07	1 18.9	31	14 22 49.21	2.127	13 10 58.7	10.72	23 42.6
32	13 58 45.23	1.993	11 3 26.9	11.08	1 15.7	32	14 23 40.28	2.129	13 15 15.6	10.69	23 39.5
Day of the Month,						Day of the Month,					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		15.3	15.0	14.8	14.7	Polar Semidiameter		14.7	14.6	14.5	14.5
Horizontal Parallax		1.4	1.4	1.4	1.4	Horizontal Parallax		1.4	1.3	1.3	1.3

GREENWICH MEAN TIME.

NOVEMBER.

DECEMBER.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	h m s	s	° ' "		h m	h m s	s				° ' "	h m							
1	14	23	40.28	2-129	-13	15	15.6	10-09	23 39.5	1	14	49	6.26	2-075	-15	15	39.9	9-21	22 6.9
2	14	24	31.39	2-130	13	19	31.7	10-05	23 36.5	2	14	49	56.02	2-070	15	19	20.3	9-14	22 3.7
3	14	25	22.53	2-131	13	23	47.1	10-02	23 33.4	3	14	50	45.64	2-064	15	22	59.2	9-08	22 0.6
4	14	26	13.71	2-132	13	28	1.6	10-58	23 30.3	4	14	51	35.12	2-058	15	26	36.5	9-02	21 57.5
5	14	27	4.91	2-133	13	32	15.3	10-55	23 27.2	5	14	52	24.46	2-052	15	30	12.2	8-96	21 54.4
6	14	27	56.13	2-134	13	36	28.1	10-51	23 24.1	6	14	53	13.65	2-046	15	33	46.2	8-88	21 51.3
7	14	28	47.37	2-135	13	40	40.0	10-47	23 21.0	7	14	54	2.69	2-038	15	37	18.6	8-81	21 48.1
8	14	29	38.61	2-135	13	44	51.0	10-42	23 18.0	8	14	54	51.56	2-031	15	40	49.4	8-74	21 45.0
9	14	30	29.86	2-135	13	49	1.0	10-39	23 14.9	9	14	55	40.26	2-025	15	44	18.4	8-67	21 41.9
10	14	31	21.10	2-134	13	53	9.9	10-35	23 11.8	10	14	56	28.78	2-017	15	47	45.7	8-60	21 38.7
11	14	32	12.33	2-133	13	57	17.8	10-31	23 8.7	11	14	57	17.12	2-009	15	51	11.3	8-53	21 35.6
12	14	33	3.55	2-132	14	1	24.7	10-26	23 5.6	12	14	58	5.27	2-000	15	54	35.1	8-45	21 32.5
13	14	33	54.74	2-132	14	5	30.5	10-21	23 2.5	13	14	58	53.21	1-991	15	57	57.2	8-38	21 29.3
14	14	34	45.91	2-131	14	9	35.2	10-17	22 59.5	14	14	59	40.94	1-983	16	1	17.4	8-31	21 26.2
15	14	35	37.04	2-129	14	13	38.8	10-12	22 56.4	15	15	0	28.46	1-975	16	4	35.8	8-23	21 23.1
16	14	36	28.13	2-127	14	17	41.2	10-07	22 53.3	16	15	1	15.76	1-966	16	7	52.4	8-16	21 19.9
17	14	37	19.18	2-125	14	21	42.4	10-03	22 50.2	17	15	2	2.84	1-958	16	11	7.1	8-07	21 16.8
18	14	38	10.18	2-123	14	25	42.4	9-97	22 47.1	18	15	2	49.68	1-946	16	14	19.9	7-99	21 13.6
19	14	39	1.13	2-121	14	29	41.1	9-92	22 44.0	19	15	3	36.28	1-938	16	17	30.9	7-91	21 10.5
20	14	39	52.02	2-119	14	33	38.5	9-86	22 41.0	20	15	4	22.64	1-926	16	20	40.0	7-83	21 7.3
21	14	40	42.84	2-115	14	37	34.6	9-81	22 37.9	21	15	5	8.75	1-915	16	23	47.1	7-75	21 4.1
22	14	41	33.58	2-112	14	41	29.4	9-75	22 34.8	22	15	5	54.60	1-905	16	26	52.3	7-67	21 0.9
23	14	42	24.25	2-109	14	45	22.9	9-70	22 31.7	23	15	6	40.18	1-898	16	29	55.6	7-59	20 57.7
24	14	43	14.84	2-105	14	49	15.0	9-64	22 28.6	24	15	7	25.49	1-881	16	32	56.9	7-51	20 54.6
25	14	44	5.34	2-102	14	53	5.7	9-58	22 25.5	25	15	8	10.53	1-870	16	35	56.2	7-43	20 51.4
26	14	44	55.75	2-098	14	56	55.1	9-52	22 22.4	26	15	8	55.29	1-858	16	38	53.5	7-35	20 48.2
27	14	45	46.07	2-094	15	0	43.0	9-46	22 19.3	27	15	9	39.75	1-846	16	41	48.8	7-26	20 45.0
28	14	46	36.29	2-090	15	4	29.5	9-40	22 16.2	28	15	10	23.92	1-833	16	44	42.1	7-17	20 41.8
29	14	47	26.39	2-086	15	8	14.5	9-34	22 13.1	29	15	11	7.79	1-820	16	47	33.3	7-09	20 38.6
30	14	48	16.38	2-080	15	11	58.0	9-27	22 10.0	30	15	11	51.34	1-807	16	50	22.5	7-00	20 35.4
31	14	49	6.26	2-075	15	15	39.9	9-21	22 6.9	31	15	12	34.57	1-794	16	53	9.7	6-92	20 32.1
32	14	49	56.02	2-070	-15	19	20.3	9-14	22 3.7	32	15	13	17.48	1-781	-16	55	54.7	6-83	20 28.9

Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	14.5	14.5	14.6	14.8
Horizontal Parallax	1.3	1.3	1.4	1.4

Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	14.8	14.9	15.1	15.5
Horizontal Parallax	1.4	1.4	1.4	1.4

GREENWICH MEAN TIME.

JANUARY.							FEBRUARY.										
Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.		
	h	m	s						h	m	s						
1	12	23	24.51	0.340	- 0 0 11.2	0.78	17 38.1	1	12	23	13.13	0.267	+ 0 10 30.9	2.44	15 35.8		
2	12	23	30.09	0.324	0 0 28.7	0.67	17 34.2	2	12	23	6.54	0.282	0 11 30.6	2.53	15 31.8		
3	12	23	35.28	0.308	0 0 43.6	0.57	17 30.4	3	12	23	59.58	0.297	0 12 32.5	2.62	15 27.7		
4	12	23	40.08	0.192	0 0 56.0	0.46	17 26.5	4	12	23	52.27	0.312	0 13 36.5	2.71	15 23.7		
5	12	23	44.49	0.175	0 1 5.8	0.35	17 22.7	5	12	23	44.60	0.327	0 14 42.7	2.80	15 19.6		
6	12	23	48.50	0.159	0 1 13.0	0.25	17 18.8	6	12	23	36.57	0.342	0 15 51.0	2.88	15 15.6		
7	12	23	52.11	0.143	0 1 17.6	0.14	17 14.9	7	12	23	28.19	0.356	0 17 1.4	2.96	15 11.5		
8	12	23	55.33	0.126	0 1 19.6	-0.03	17 11.0	8	12	23	19.46	0.370	0 18 13.9	3.04	15 7.4		
9	12	23	58.15	0.109	0 1 19.0	+0.08	17 7.1	9	12	23	10.40	0.385	0 19 28.4	3.12	15 3.3		
10	12	24	0.57	0.092	0 1 15.9	0.18	17 3.2	10	12	23	1.00	0.399	0 20 44.9	3.22	14 59.2		
11	12	24	2.59	0.076	0 1 10.2	0.29	16 59.3	11	12	21	51.26	0.413	0 22 3.4	3.31	14 55.1		
12	12	24	4.21	0.060	0 1 1.9	0.40	16 55.4	12	12	21	41.19	0.426	0 23 23.8	3.39	14 51.0		
13	12	24	5.43	0.043	0 0 51.0	0.51	16 51.5	13	12	21	30.80	0.440	0 24 46.1	3.47	14 46.9		
14	12	24	6.25	0.026	0 0 37.6	0.61	16 47.5	14	12	21	20.09	0.453	0 26 10.2	3.54	14 42.8		
15	12	24	6.66	+0.009	0 0 21.6	0.72	16 43.6	15	12	21	9.07	0.468	0 27 36.1	3.61	14 38.7		
16	12	24	6.67	-0.008	- 0 0 3.0	0.83	16 39.7	16	12	20	57.74	0.478	0 29 3.7	3.68	14 34.6		
17	12	24	6.28	0.028	+ 0 0 18.2	0.94	16 35.7	17	12	20	46.11	0.491	0 30 33.0	3.76	14 30.5		
18	12	24	5.48	0.043	0 0 41.9	1.04	16 31.8	18	12	20	34.18	0.508	0 32 4.0	3.83	14 26.3		
19	12	24	4.23	0.058	0 1 8.1	1.14	16 27.8	19	12	20	21.96	0.516	0 33 36.6	3.89	14 22.2		
20	12	24	2.69	0.076	0 1 36.8	1.25	16 23.9	20	12	20	9.46	0.526	0 35 10.8	3.96	14 18.0		
21	12	24	0.70	0.091	0 2 8.0	1.35	16 19.9	21	12	19	56.60	0.537	0 36 46.5	4.02	14 13.9		
22	12	23	58.32	0.107	0 2 41.7	1.46	16 15.9	22	12	19	43.66	0.548	0 38 23.6	4.08	14 9.7		
23	12	23	55.54	0.124	0 3 17.9	1.56	16 11.9	23	12	19	30.37	0.559	0 40 2.1	4.13	14 5.5		
24	12	23	52.36	0.141	0 3 56.5	1.66	16 7.9	24	12	19	16.83	0.569	0 41 42.0	4.19	14 1.4		
25	12	23	48.79	0.157	0 4 37.5	1.76	16 3.9	25	12	19	3.04	0.579	0 43 23.2	4.24	13 57.2		
26	12	23	44.84	0.173	0 5 20.9	1.86	15 59.9	26	12	18	49.02	0.589	0 45 5.6	4.29	13 53.1		
27	12	23	40.50	0.189	0 6 6.7	1.96	15 55.9	27	12	18	34.77	0.596	0 46 49.1	4.34	13 48.9		
28	12	23	35.78	0.205	0 6 54.9	2.06	15 51.9	28	12	18	20.30	0.607	0 48 33.7	4.38	13 44.7		
29	12	23	30.68	0.220	0 7 45.5	2.16	15 47.9	29	12	18	5.62	0.616	0 50 19.4	4.43	13 40.6		
30	12	23	25.20	0.236	0 8 38.4	2.24	15 43.9	30	12	17	50.74	0.624	0 52 6.1	4.47	13 36.4		
31	12	23	19.35	0.251	0 9 33.5	2.34	15 39.9	31	12	17	35.66	0.632	0 53 53.8	4.51	13 32.2		
32	12	23	13.13	0.267	+ 0 10 30.9	2.44	15 35.8	32	12	17	20.39	0.640	+ 0 55 42.5	4.55	13 28.0		
Day of the Month,							1st.	11th.	21st.	31st.	Day of the Month,						
Polar Semidiameter							8.3	8.5	8.6	8.8	Polar Semidiameter						
Horizontal Parallax							0.9	0.9	0.9	1.0	Horizontal Parallax						
Polar Semidiameter							8.8	8.9	9.0	9.1	Polar Semidiameter						
Horizontal Parallax							1.0	1.0	1.0	1.0	Horizontal Parallax						

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.				Noon.				
	h	m	s	"	°	'	"	"	h m
1	12	18	5.62	0.616	+	0 59	19.4	4.43	13 40.6
2	12	17	50.74	0.624		0 52	6.1	4.47	13 36.4
3	12	17	35.66	0.632		0 53	53.8	4.51	13 32.2
4	12	17	20.39	0.640		0 55	42.5	4.55	13 28.0
5	12	17	4.94	0.647		0 57	32.0	4.59	13 23.8
6	12	16	49.32	0.654		0 59	22.3	4.61	13 19.6
7	12	16	33.53	0.661		1 1	13.3	4.64	13 15.4
8	12	16	17.59	0.667		1 3	5.0	4.67	13 11.2
9	12	16	1.50	0.673		1 4	57.3	4.69	13 7.0
10	12	15	45.27	0.679		1 6	50.2	4.71	13 2.8
11	12	15	28.91	0.684		1 8	43.6	4.73	12 58.6
12	12	15	12.43	0.689		1 10	37.4	4.75	12 54.4
13	12	14	55.84	0.694		1 12	31.6	4.76	12 50.2
14	12	14	39.14	0.699		1 14	26.1	4.79	12 46.0
15	12	14	22.35	0.701		1 16	20.0	4.79	12 41.8
16	12	14	5.47	0.704		1 18	15.9	4.79	12 37.6
17	12	13	48.52	0.708		1 20	11.0	4.80	12 33.4
18	12	13	31.50	0.710		1 22	6.2	4.80	12 29.2
19	12	13	14.42	0.713		1 24	1.3	4.80	12 25.0
20	12	12	57.30	0.714		1 25	56.4	4.79	12 20.7
21	12	12	40.14	0.716		1 27	51.4	4.79	12 16.5
22	12	12	22.96	0.716		1 29	46.2	4.78	12 12.3
23	12	12	5.76	0.717		1 31	40.7	4.76	12 8.1
24	12	11	48.56	0.717		1 33	34.8	4.75	12 3.9
25	12	11	31.36	0.716		1 35	28.5	4.73	11 59.6
26	12	11	14.17	0.716		1 37	21.8	4.71	11 55.4
27	12	10	57.01	0.714		1 39	14.6	4.69	11 51.2
28	12	10	39.88	0.713		1 41	6.8	4.66	11 47.0
29	12	10	22.79	0.711		1 42	58.3	4.63	11 42.8
30	12	10	5.75	0.709		1 44	49.1	4.60	11 38.5
31	12	9	48.77	0.706		1 46	39.1	4.57	11 34.3
32	12	9	31.86	0.703	+	1 48	28.4	4.54	11 30.1

APRIL.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.				Noon.				
	h	m	s	"	°	'	"	"	h m
1	12	9	31.86	0.703	+	1 48	28.4	4.54	11 30.1
2	12	9	15.03	0.700		1 50	16.9	4.50	11 25.9
3	12	8	58.23	0.696		1 52	4.5	4.46	11 21.7
4	12	8	41.63	0.693		1 53	51.1	4.42	11 17.5
5	12	8	25.08	0.697		1 55	36.7	4.38	11 13.3
6	12	8	8.64	0.693		1 57	21.2	4.33	11 9.1
7	12	7	52.32	0.679		1 59	4.6	4.28	11 4.9
8	12	7	36.12	0.675		2 0	46.8	4.23	11 0.7
9	12	7	20.06	0.668		2 2	27.8	4.18	10 56.5
10	12	7	4.14	0.660		2 4	7.5	4.13	10 52.3
11	12	6	48.38	0.633		2 5	45.9	4.07	10 48.1
12	12	6	32.78	0.646		2 7	22.9	4.01	10 43.9
13	12	6	17.35	0.639		2 8	58.4	3.93	10 39.7
14	12	6	2.09	0.632		2 10	32.4	3.88	10 35.5
15	12	5	47.01	0.624		2 12	4.9	3.82	10 31.3
16	12	5	32.13	0.616		2 13	35.8	3.76	10 27.2
17	12	5	17.46	0.607		2 15	5.1	3.68	10 23.0
18	12	5	3.00	0.599		2 16	32.7	3.61	10 18.8
19	12	4	48.75	0.590		2 17	58.6	3.54	10 14.7
20	12	4	34.72	0.580		2 19	22.8	3.47	10 10.5
21	12	4	20.93	0.570		2 20	45.1	3.39	10 6.3
22	12	4	7.98	0.560		2 22	5.6	3.31	10 2.2
23	12	3	54.07	0.549		2 23	24.2	3.23	9 58.0
24	12	3	41.02	0.538		2 24	40.9	3.16	9 53.9
25	12	3	28.23	0.527		2 25	55.6	3.07	9 49.7
26	12	3	15.70	0.516		2 27	8.3	2.99	9 45.6
27	12	3	3.44	0.506		2 28	19.0	2.90	9 41.5
28	12	2	51.46	0.493		2 29	27.6	2.82	9 37.3
29	12	2	39.77	0.481		2 30	34.2	2.73	9 33.2
30	12	2	28.36	0.469		2 31	38.7	2.64	9 29.1
31	12	2	17.24	0.457		2 32	41.0	2.56	9 25.0
32	12	2	6.41	0.445	+	2 33	41.2	2.46	9 20.9

Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	9.1	9.2	9.2	9.2
Horizontal Parallax	1.0	1.0	1.0	1.0

Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	9.2	9.1	9.0	8.9
Horizontal Parallax	1.0	1.0	1.0	1.0

GREENWICH MEAN TIME.

MAY.										JUNE.													
Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.				
	Noon.				Noon.						Noon.				Noon.								
	h	m	s	s	°	'	"	"	h	m	h	m	s	s	°	'	"	"	h	m			
1	12	2	17.24	0.457	+	2	32	41.0	2.55	9	25.0	1	11	59	17.59	-0.009	+	2	45	32.6	0.55	7	20.2
2	12	2	6.41	0.445		2	33	41.2	2.46	9	20.9	2	11	59	17.57	+0.007		2	45	18.3	0.53	7	16.2
3	12	1	55.88	0.433		2	34	39.2	2.37	9	16.8	3	11	59	17.92	0.023		2	45	1.5	0.75	7	12.3
4	12	1	45.65	0.420		2	35	35.0	2.28	9	12.7	4	11	59	18.64	0.038		2	44	42.3	0.63	7	8.4
5	12	1	35.73	0.407		2	36	28.6	2.19	9	8.6	5	11	59	19.73	0.053		2	44	20.6	0.93	7	4.5
6	12	1	26.12	0.394		2	37	19.9	2.09	9	4.5	6	11	59	21.20	0.069		2	43	56.5	1.03	7	0.6
7	12	1	16.83	0.380		2	38	9.0	2.00	9	0.4	7	11	59	23.04	0.084		2	43	29.9	1.16	6	56.7
8	12	1	7.87	0.366		2	38	55.8	1.90	8	56.3	8	11	59	25.25	0.100		2	43	0.9	1.26	6	52.8
9	12	0	59.24	0.353		2	39	40.2	1.80	8	52.3	9	11	59	27.33	0.115		2	42	29.4	1.36	6	48.9
10	12	0	50.93	0.339		2	40	22.3	1.71	8	48.2	10	11	59	30.78	0.131		2	41	55.5	1.46	6	45.0
11	12	0	42.95	0.325		2	41	2.1	1.61	8	44.1	11	11	59	34.10	0.146		2	41	19.2	1.56	6	41.1
12	12	0	35.31	0.311		2	41	39.5	1.51	8	40.1	12	11	59	37.79	0.161		2	40	40.5	1.66	6	37.2
13	12	0	28.02	0.297		2	42	14.5	1.41	8	36.0	13	11	59	41.84	0.176		2	39	59.5	1.76	6	33.4
14	12	0	21.07	0.283		2	42	47.2	1.31	8	32.0	14	11	59	46.26	0.192		2	39	16.1	1.86	6	29.5
15	12	0	14.47	0.268		2	43	17.5	1.21	8	27.9	15	11	59	51.05	0.207		2	38	30.3	1.96	6	25.7
16	12	0	8.22	0.253		2	43	45.3	1.11	8	23.9	16	11	59	56.21	0.223		2	37	42.1	2.06	6	21.9
17	12	0	2.32	0.239		2	44	10.6	1.00	8	19.9	17	12	0	1.74	0.238		2	36	51.5	2.16	6	18.0
18	11	59	56.77	0.224		2	44	33.4	0.90	8	15.8	18	12	0	7.64	0.253		2	35	58.6	2.26	6	14.2
19	11	59	51.58	0.209		2	44	53.7	0.80	8	11.8	19	12	0	13.90	0.268		2	35	3.4	2.35	6	10.4
20	11	59	46.75	0.194		2	45	11.6	0.69	8	7.8	20	12	0	20.51	0.283		2	34	5.9	2.44	6	6.5
21	11	59	42.23	0.179		2	45	27.0	0.59	8	3.8	21	12	0	27.48	0.298		2	33	6.1	2.54	6	2.7
22	11	59	38.20	0.163		2	45	39.9	0.49	7	59.8	22	12	0	34.80	0.313		2	32	4.1	2.63	5	58.9
23	11	59	34.48	0.148		2	45	50.3	0.38	7	55.8	23	12	0	42.48	0.327		2	30	59.8	2.73	5	55.1
24	11	59	31.12	0.132		2	45	58.3	0.28	7	51.8	24	12	0	50.51	0.342		2	29	53.3	2.83	5	51.3
25	11	59	28.13	0.116		2	46	3.8	0.18	7	47.8	25	12	0	58.89	0.356		2	28	44.6	2.91	5	47.5
26	11	59	25.51	0.101		2	46	6.8	+0.07	7	43.8	26	12	1	7.61	0.370		2	27	33.7	3.00	5	43.7
27	11	59	23.26	0.086		2	46	7.3	-0.03	7	39.9	27	12	1	16.67	0.385		2	26	20.6	3.09	5	39.9
28	11	59	21.38	0.071		2	46	5.3	0.14	7	35.9	28	12	1	26.08	0.399		2	25	5.4	3.18	5	36.2
29	11	59	19.87	0.055		2	46	0.8	0.24	7	32.0	29	12	1	35.83	0.413		2	23	48.1	3.26	5	32.4
30	11	59	18.74	0.039		2	45	53.9	0.34	7	28.0	30	12	1	45.91	0.427		2	22	28.7	3.35	5	28.6
31	11	59	17.98	0.024		2	45	44.5	0.44	7	24.1	31	12	1	56.32	0.441		2	21	7.2	3.44	5	24.9
32	11	59	17.59	0.009	+	2	45	32.6	0.55	7	20.2	32	12	2	7.07	0.455	+	2	19	43.6	3.53	5	21.1
Day of the Month,										Day of the Month,													
				1st.					11th.					21st.					31st.				
Polar Semidiameter				8.9					8.8					8.7					8.5				
Horizontal Parallax				1.0					1.0					1.0					0.9				
Polar Semidiameter										Polar Semidiameter													
Horizontal Parallax										Horizontal Parallax													
				8.9					8.8					8.7					8.5				
				1.0					1.0					1.0					0.9				

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.				Noon.				
	h	m	s	"	°	'	"	"	h m
1	12	1	56.32	0.441	+	2 21	7.2	3.44	5 24.9
2	12	2	7.07	0.436		2 19	43.6	3.53	5 21.1
3	12	2	18.15	0.430		2 18	18.0	3.61	5 17.4
4	12	2	29.56	0.423		2 16	50.3	3.70	5 13.6
5	12	2	41.29	0.416		2 15	20.6	3.78	5 9.9
6	12	2	53.31	0.409		2 13	48.9	3.86	5 6.2
7	12	3	5.70	0.422		2 12	15.2	3.94	5 2.4
8	12	3	18.38	0.393		2 10	39.6	4.02	4 58.7
9	12	3	31.37	0.348		2 9	2.1	4.10	4 55.0
10	12	3	44.63	0.361		2 7	22.6	4.19	4 51.3
11	12	3	58.30	0.374		2 5	41.2	4.27	4 47.6
12	12	4	12.22	0.386		2 3	57.8	4.35	4 43.9
13	12	4	26.45	0.399		2 2	12.5	4.43	4 40.2
14	12	4	40.98	0.412		2 0	25.4	4.50	4 36.5
15	12	4	55.81	0.424		1 58	36.6	4.57	4 32.8
16	12	5	10.94	0.436		1 56	46.0	4.65	4 29.1
17	12	5	26.36	0.448		1 54	53.6	4.72	4 25.4
18	12	5	42.06	0.460		1 52	59.4	4.79	4 21.8
19	12	5	58.05	0.472		1 51	3.5	4.86	4 18.1
20	12	6	14.32	0.484		1 49	5.9	4.93	4 14.4
21	12	6	30.87	0.496		1 47	6.7	5.00	4 10.8
22	12	6	47.69	0.707		1 45	5.8	5.07	4 7.1
23	12	7	4.79	0.718		1 43	3.3	5.14	4 3.5
24	12	7	22.16	0.729		1 40	59.2	5.20	3 59.9
25	12	7	39.79	0.740		1 38	53.6	5.27	3 56.2
26	12	7	57.67	0.750		1 36	46.4	5.33	3 52.6
27	12	8	15.81	0.761		1 34	37.7	5.39	3 49.0
28	12	8	34.20	0.771		1 32	27.5	5.46	3 45.4
29	12	8	52.84	0.782		1 30	15.8	5.52	3 41.7
30	12	9	11.73	0.792		1 28	2.7	5.58	3 38.1
31	12	9	30.86	0.802		1 25	48.2	5.63	3 34.5
32	12	9	50.23	0.812	+	1 23	32.3	5.69	3 30.9

AUGUST.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.				Noon.				
	h	m	s	"	°	'	"	"	h m
1	12	9	50.23	0.812	+	1	23 32.3	5.69	3 30.9
2	12	10	9.83	0.822		1	21 14.0	5.76	3 27.3
3	12	10	29.67	0.831		1	18 56.2	5.81	3 23.7
4	12	10	49.74	0.841		1	16 36.2	5.86	3 20.1
5	12	11	10.04	0.850		1	14 14.0	5.91	3 16.5
6	12	11	30.56	0.860		1	11 52.3	5.97	3 12.9
7	12	11	51.30	0.869		1	9 28.4	6.02	3 9.3
8	12	12	12.25	0.878		1	7 3.3	6.07	3 5.7
9	12	12	33.42	0.887		1	4 37.0	6.12	3 2.1
10	12	12	54.81	0.896		1	2 9.5	6.17	2 58.5
11	12	13	16.41	0.904		0	59 40.8	6.22	2 54.9
12	12	13	38.21	0.912		0	57 10.9	6.27	2 51.4
13	12	14	0.21	0.921		0	54 39.9	6.31	2 47.8
14	12	14	22.41	0.929		0	52 7.9	6.36	2 44.2
15	12	14	44.80	0.937		0	49 34.8	6.40	2 40.7
16	12	15	7.38	0.945		0	47 0.6	6.45	2 37.1
17	12	15	30.14	0.952		0	44 25.4	6.49	2 33.6
18	12	15	53.08	0.960		0	41 49.2	6.53	2 30.0
19	12	16	16.20	0.967		0	39 12.1	6.56	2 26.5
20	12	16	39.49	0.974		0	36 34.1	6.60	2 23.0
21	12	17	2.95	0.981		0	33 55.2	6.64	2 19.4
22	12	17	26.57	0.988		0	31 15.4	6.67	2 15.9
23	12	17	50.36	0.995		0	28 34.8	6.71	2 12.4
24	12	18	14.31	1.001		0	25 53.4	6.74	2 8.8
25	12	18	38.41	1.007		0	23 11.2	6.77	2 5.3
26	12	19	2.65	1.013		0	20 28.2	6.81	2 1.8
27	12	19	27.04	1.019		0	17 44.4	6.84	1 58.3
28	12	19	51.57	1.025		0	14 59.9	6.87	1 54.7
29	12	20	16.24	1.031		0	12 14.7	6.90	1 51.2
30	12	20	41.05	1.036		0	9 28.9	6.92	1 47.7
31	12	21	5.99	1.042		0	6 42.4	6.96	1 44.2
32	12	21	31.06	1.047	+	0	3 55.4	6.97	1 40.7

Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	8.1	8.0	7.8	7.7
Horizontal Parallax	0.9	0.9	0.9	0.9

Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	7.7	7.6	7.5	7.5
Horizontal Parallax	0.9	0.8	0.8	0.8

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	s	h m
1	12 21 31.06	1.047	+ 0 3 55.4	6.97	1 40.7	1	12 34 44.85	1.134	1 22 17.0	7.22	23 52.4
2	12 21 56.26	1.062	+ 0 1 7.8	7.00	1 37.1	2	12 35 12.06	1.134	1 25 10.3	7.22	23 48.9
3	12 22 21.58	1.067	- 0 1 40.4	7.02	1 33.6	3	12 35 39.27	1.134	1 28 3.4	7.21	23 45.4
4	12 22 47.02	1.062	0 4 29.2	7.06	1 30.1	4	12 36 6.48	1.134	1 30 56.2	7.19	23 41.9
5	12 23 12.57	1.067	0 7 18.6	7.07	1 26.6	5	12 36 33.69	1.134	1 33 48.7	7.18	23 38.4
6	12 23 38.24	1.073	0 10 8.5	7.08	1 23.1	6	12 37 0.90	1.134	1 36 41.0	7.17	23 35.0
7	12 24 4.02	1.076	0 12 58.8	7.11	1 19.6	7	12 37 28.10	1.133	1 39 33.0	7.16	23 31.5
8	12 24 29.90	1.080	0 15 49.6	7.13	1 16.1	8	12 37 55.29	1.133	1 42 24.6	7.14	23 28.0
9	12 24 55.88	1.083	0 18 40.8	7.14	1 12.6	9	12 38 22.47	1.132	1 45 15.8	7.13	23 24.5
10	12 25 21.96	1.089	0 21 32.4	7.16	1 9.1	10	12 38 49.62	1.131	1 48 6.6	7.11	23 21.0
11	12 25 48.14	1.093	0 24 24.3	7.17	1 5.6	11	12 39 16.75	1.130	1 50 57.0	7.09	23 17.6
12	12 26 14.41	1.096	0 27 16.6	7.19	1 2.1	12	12 39 43.85	1.129	1 53 46.9	7.07	23 14.1
13	12 26 40.76	1.099	0 30 9.2	7.20	0 58.6	13	12 40 10.92	1.127	1 56 36.3	7.06	23 10.6
14	12 27 7.18	1.102	0 33 2.1	7.21	0 55.1	14	12 40 37.95	1.126	1 59 25.2	7.03	23 7.1
15	12 27 33.68	1.106	0 35 55.2	7.23	0 51.6	15	12 41 4.93	1.123	2 2 13.6	7.00	23 3.6
16	12 28 0.25	1.109	0 38 48.5	7.23	0 48.1	16	12 41 31.86	1.121	2 5 1.4	6.98	23 0.2
17	12 28 26.89	1.111	0 41 42.0	7.23	0 44.6	17	12 41 58.75	1.119	2 7 48.6	6.96	22 56.7
18	12 28 53.59	1.114	0 44 35.7	7.24	0 41.1	18	12 42 25.58	1.117	2 10 35.1	6.92	22 53.2
19	12 29 20.36	1.117	0 47 29.5	7.25	0 37.6	19	12 42 52.35	1.114	2 13 20.9	6.89	22 49.7
20	12 29 47.19	1.119	0 50 23.5	7.25	0 34.1	20	12 43 19.05	1.111	2 16 6.0	6.86	22 46.2
21	12 30 14.07	1.121	0 53 17.6	7.25	0 30.7	21	12 43 45.68	1.108	2 18 50.4	6.83	22 42.7
22	12 30 40.99	1.123	0 56 11.7	7.25	0 27.2	22	12 44 12.24	1.106	2 21 34.1	6.80	22 39.2
23	12 31 7.36	1.125	0 59 5.8	7.25	0 23.7	23	12 44 38.72	1.102	2 24 17.0	6.77	22 35.7
24	12 31 34.97	1.126	1 1 59.9	7.25	0 20.2	24	12 45 5.12	1.098	2 26 59.2	6.74	22 32.2
25	12 32 2.02	1.128	1 4 54.0	7.25	0 16.7	25	12 45 31.44	1.096	2 29 40.6	6.71	22 28.7
26	12 32 29.10	1.129	1 7 48.1	7.25	0 13.3	26	12 45 57.68	1.091	2 32 21.1	6.67	22 25.2
27	12 32 56.20	1.130	1 10 42.1	7.25	0 9.8	27	12 46 23.82	1.087	2 35 0.7	6.63	22 21.7
28	12 33 23.32	1.131	1 13 36.0	7.24	0 6.3	28	12 46 49.87	1.083	2 37 39.4	6.59	22 18.2
29	12 33 50.47	1.132	1 16 29.8	7.24	0 2.8	29	12 47 15.82	1.079	2 40 17.2	6.56	22 14.7
30	12 34 17.65	1.133	1 19 23.5	7.23	23 55.9	30	12 47 41.66	1.074	2 42 54.1	6.53	22 11.2
31	12 34 44.85	1.134	1 22 17.0	7.22	23 52.4	31	12 48 7.39	1.070	2 45 30.1	6.48	22 7.7
32	12 35 12.06	1.134	- 1 25 10.3	7.22	23 48.9	32	12 48 33.01	1.065	- 2 48 5.1	6.44	22 4.2
Day of the Month,						Day of the Month,					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		7.5	7.4	7.4	7.4	Polar Semidiameter		7.4	7.4	7.4	7.5
Horizontal Parallax		0.8	0.8	0.8	0.8	Horizontal Parallax		0.8	0.8	0.8	0.8

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	12 48 33.01	1.065	2 48 5.1	6.44	22 4.2	1	13 0 7.37	0.886	3 55 38.9	4.67	20 17.7
2	12 48 58.51	1.060	2 50 39.1	6.39	22 0.7	2	13 0 27.32	0.896	3 57 30.1	4.60	20 14.1
3	12 49 23.89	1.055	2 53 12.0	6.35	21 57.2	3	13 0 47.02	0.816	3 59 19.5	4.52	20 10.5
4	12 49 49.15	1.050	2 55 43.8	6.30	21 53.7	4	13 1 6.47	0.806	4 1 7.0	4.44	20 6.9
5	12 50 14.29	1.045	2 58 14.5	6.26	21 50.1	5	13 1 25.66	0.794	4 2 52.7	4.37	20 3.2
6	12 50 39.29	1.039	3 0 44.1	6.21	21 46.6	6	13 1 44.58	0.788	4 4 36.6	4.29	19 59.6
7	12 51 4.15	1.033	3 3 12.5	6.16	21 43.1	7	13 2 3.23	0.771	4 6 18.5	4.21	19 56.0
8	12 51 28.87	1.027	3 5 39.7	6.11	21 39.6	8	13 2 21.61	0.760	4 7 58.5	4.13	19 52.4
9	12 51 53.44	1.021	3 8 5.7	6.06	21 36.1	9	13 2 39.71	0.748	4 9 36.6	4.06	19 48.8
10	12 52 17.86	1.014	3 10 30.5	6.01	21 32.5	10	13 2 57.53	0.737	4 11 12.7	3.98	19 45.1
11	12 52 42.12	1.007	3 12 54.0	5.95	21 29.0	11	13 3 15.07	0.725	4 12 46.8	3.88	19 41.5
12	12 53 6.21	1.000	3 15 16.2	5.90	21 25.5	12	13 3 32.31	0.712	4 14 18.9	3.79	19 37.8
13	12 53 30.13	0.993	3 17 37.1	5.84	21 21.9	13	13 3 49.26	0.700	4 15 49.0	3.71	19 34.1
14	12 53 53.88	0.986	3 19 56.6	5.79	21 18.4	14	13 4 5.91	0.687	4 17 17.0	3.63	19 30.5
15	12 54 17.46	0.979	3 22 14.8	5.73	21 14.8	15	13 4 22.25	0.674	4 18 43.0	3.54	19 26.8
16	12 54 40.86	0.971	3 24 31.6	5.67	21 11.3	16	13 4 38.28	0.661	4 20 6.9	3.45	19 23.1
17	12 55 4.07	0.963	3 26 46.9	5.61	21 7.8	17	13 4 54.00	0.649	4 21 28.7	3.36	19 19.5
18	12 55 27.09	0.955	3 29 0.8	5.55	21 4.2	18	13 5 9.41	0.636	4 22 48.3	3.27	19 15.8
19	12 55 49.92	0.947	3 31 13.2	5.49	21 0.7	19	13 5 24.51	0.622	4 24 5.8	3.18	19 12.1
20	12 56 12.55	0.939	3 33 24.1	5.42	20 57.1	20	13 5 39.29	0.609	4 25 21.1	3.09	19 8.4
21	12 56 34.98	0.930	3 35 33.5	5.36	20 53.6	21	13 5 53.74	0.595	4 26 34.3	3.00	19 4.7
22	12 56 57.21	0.922	3 37 41.3	5.29	20 50.0	22	13 6 7.86	0.581	4 27 45.3	2.91	19 1.0
23	12 57 19.23	0.913	3 39 47.6	5.23	20 46.4	23	13 6 21.65	0.568	4 28 54.1	2.82	18 57.3
24	12 57 41.03	0.904	3 41 52.3	5.16	20 42.9	24	13 6 35.11	0.554	4 30 0.7	2.73	18 53.6
25	12 58 2.62	0.896	3 43 55.4	5.10	20 39.3	25	13 6 48.24	0.540	4 31 5.2	2.64	18 49.9
26	12 58 23.99	0.888	3 45 56.9	5.03	20 35.7	26	13 7 1.03	0.526	4 32 7.4	2.54	18 46.2
27	12 58 45.13	0.879	3 47 56.7	4.96	20 32.1	27	13 7 13.47	0.511	4 33 7.3	2.45	18 42.4
28	12 59 6.04	0.868	3 49 54.8	4.89	20 28.5	28	13 7 25.57	0.497	4 34 4.9	2.35	18 38.7
29	12 59 26.72	0.857	3 51 51.2	4.81	20 24.9	29	13 7 37.32	0.482	4 35 0.3	2.26	18 35.0
30	12 59 47.17	0.847	3 53 45.9	4.74	20 21.3	30	13 7 48.71	0.467	4 35 53.4	2.16	18 31.2
31	13 0 7.37	0.835	3 55 38.9	4.67	20 17.7	31	13 7 59.74	0.452	4 36 44.2	2.07	18 27.5
32	13 0 27.32	0.826	3 57 30.1	4.60	20 14.1	32	13 8 10.42	0.437	4 37 32.6	1.97	18 23.7
NOVEMBER.						DECEMBER.					
Day of the Month,	1st.	11th.	21st.	31st.		Day of the Month,	1st.	11th.	21st.	31st.	
Polar Semidiameter	7.5	7.5	7.6	7.7		Polar Semidiameter	7.7	7.8	7.9	8.1	
Horizontal Parallax	0.9	0.8	0.8	0.8		Horizontal Parallax	0.8	0.9	0.9	0.9	

242 SUN'S COÖRDINATES, 1863.

Greenwich Mean Noon.		X.	Y.	Z.	Greenwich Mean Noon.		X.	Y.	Z.
Jan.	1	d			Mar.	1	d		
	2	1	+1817474	—8864470		2	60	+9342152	—3043083
	3	2	.1988034	.8833404		3	61	.9401075	.2993444
	4	3	.2159969	.8799602		4	62	.9457153	.2742939
	5	4	.2330234	.8763077		5	63	.9510377	.2591611
	6	5	.2493774	.8723840		6	64	.9560734	.2439503
	7	6	+2668544	—8681901		7	65	+9608213	—2286658
	8	7	.2836492	.8637272		8	66	.9652801	.2133122
	9	8	.3003569	.8589964		9	67	.9694485	.1978938
	10	9	.3169726	.8539992		10	68	.9733253	.1824149
	11	10	.3334911	.8487369		11	69	.9768906	.1668900
	12	11	+3499073	—8432107		12	70	+9802004	—1512935
	13	12	.3662162	.8374220		13	71	.9831968	.1356601
	14	13	.3824127	.8313723		14	72	.9858974	.1199846
	15	14	.3984915	.8250632		15	73	.9883011	.1042718
	16	15	.4144475	.8184964		16	74	.9904072	.0885261
	17	16	+4302757	—8116738		17	75	+9922151	—0727522
	18	17	.4459706	.8045975		18	76	.9937242	.0565652
	19	18	.4615269	.7972699		19	77	.9949342	.0411403
	20	19	.4769395	.7896933		20	78	.9958445	.0253126
	21	20	.4922034	.7818702		21	79	.9964549	—0094773
	22	21	+5073136	—7738031		22	80	+9967655	+0063609
	23	22	.5222648	.7654948		23	81	.9967768	.0221971
	24	23	.5370524	.7569483		24	82	.9964893	.0380259
	25	24	.5516721	.7481668		25	83	.9959034	.0538419
	26	25	.5661193	.7391534		26	84	.9950198	.0696404
	27	26	+5803894	—7299112		27	85	+9938394	+0854166
	28	27	.5944781	.7204434		28	86	.9923633	.1011660
	29	28	.6083813	.7107537		29	87	.9905924	.1168840
	30	29	.6220952	.7008453		30	88	.9885279	.1325661
	31	30	.6356159	.6907213		31	89	.9861712	.1482075
Feb.	1	31	+6489398	—6803849	Apr.	1	90	+9835234	+1638036
	2	32	.6620633	.6698395		2	91	.9805857	.1793504
	3	33	.6749829	.6590887		3	92	.9773591	.1948438
	4	34	.6876949	.6481357		4	93	.9738449	.2102798
	5	35	.7001955	.6369838		5	94	.9700443	.2256540
	6	36	+7124811	—6256362		6	95	+9650587	+2409622
	7	37	.7245484	.6140961		7	96	.9615897	.2562000
	8	38	.7363939	.6023669		8	97	.9569384	.2713634
	9	39	.7480143	.5904520		9	98	.9520061	.2864482
	10	40	.7594060	.5783549		10	99	.9467939	.3014502
	11	41	+7705655	—5660791		11	100	+9413033	+3163652
	12	42	.7814891	.5536231		12	101	.9355357	.3311888
	13	43	.7921731	.5410059		13	102	.9294929	.3459166
	14	44	.8026142	.5282160		14	103	.9231767	.3605441
	15	45	.8128092	.5152622		15	104	.9165889	.3750667
	16	46	+8227550	—5021485		16	105	+9097315	+3894801
	17	47	.8324478	.4888730		17	106	.9026063	.4037800
	18	48	.8418843	.4754587		18	107	.8952156	.4179619
	19	49	.8510617	.4618923		19	108	.8875619	.4320217
	20	50	.8599772	.4481840		20	109	.8796477	.4459550
	21	51	+8686281	—4343380		21	110	+8714758	+4597573
	22	52	.8770118	.4203590		22	111	.8630492	.4734241
	23	53	.8851258	.4062518		23	112	.8543710	.4869513
	24	54	.8926930	.3920211		24	113	.8454442	.5003355
	25	55	.9005366	.3776716		25	114	.8362718	.5135729
	26	56	+9078297	—3632082		26	115	+8268571	+5266600
	27	57	.9148458	.3486356		27	116	.8172032	.5395933
	28	58	.9215831	.3339584		28	117	.8073134	.5523692
	29	59	.9280400	.3191811		29	118	.7971910	.5649841
	30	60	.9342152	.3043083		30	119	.7868394	.5774348
31	61		+9401075	—2893444	31	120	+7762617	+5897181	+2558742
	62		+9457153	—2742939		121	+7654615	+6018309	+2611303

SUN'S COORDINATES, 1863. 243

Greenwich Mean Noon.				X.	Y.	Z.	Greenwich Mean Noon.				X.	Y.	Z.
May	1	121		+7654615	+6018309	+2611303	July	1	182		-1608155	+9209654	+3996025
	2	122		7544418	6137704	2663114		2	183		1774911	9183903	3984858
	3	123		7432058	6255337	2714160		3	184		1941174	9155579	3972571
	4	124		7317564	6371179	2764429		4	185		2106900	9124687	3959168
	5	125		7200968	6485199	2813908		5	186		2272046	9091235	3944653
	6	126		+7082303	+6597366	+2862583		6	187		-2436568	+9055231	+3929029
	7	127		6961603	6707647	2910440		7	188		2600417	9016682	3912300
	8	128		6838899	6816013	2957465		8	189		2763548	8975596	3894469
	9	129		6714225	6922435	3003645		9	190		2925917	8931979	3875541
	10	130		6587614	7026882	3048967		10	191		3087476	8885838	3855517
	11	131		+6459100	+7129324	+3093417		11	192		-3248177	+8837184	+3834402
	12	132		6328717	7229730	3136982		12	193		3407973	8786031	3812199
	13	133		6196502	7328069	3179649		13	194		3566815	8732391	3788915
	14	134		6062496	7424309	3221404		14	195		3724654	8676274	3764558
	15	135		5926740	7518422	3262234		15	196		3881441	8617697	3739137
June	16	136		+5789276	+7610379	+3302126	Aug.	16	197		-4037130	+8556678	+3712657
	17	137		5650146	7700150	3341069		17	198		4191673	8493231	3685124
	18	138		5509393	7787708	3379053		18	199		4345028	8427374	3655547
	19	139		5367061	7873030	3416067		19	200		4497142	8359131	3626937
	20	140		5223193	7956092	3452099		20	201		4647971	8285525	3596306
	21	141		+5077834	+8036869	+3487140		21	202		-4797471	+8215581	+3564661
	22	142		4931029	8115338	3521182		22	203		4945601	8140321	3532011
	23	143		4782825	8191480	3554216		23	204		5092320	8062768	3498366
	24	144		4633269	8265278	3586233		24	205		5237588	7982944	3463737
	25	145		4482407	8336714	3617228		25	206		5381365	7900874	3428135
	26	146		+4330287	+8405774	+3647194		26	207		-5523614	+7816582	+3391570
	27	147		4176952	8472444	3676124		27	208		5664297	7730095	3354053
	28	148		4022444	8536707	3704010		28	209		5803377	7641440	3315593
	29	149		3866810	8598549	3730846		29	210		5940819	7550639	3276201
	30	150		3710094	8657958	3756627		30	211		6076587	7457716	3235887
July	31	151		+3552337	+8714921	+3781347	Aug.	31	212		-6210644	+7362695	+3194661
	1	152		3393580	8769422	3805000		1	213		6342955	7265602	3152535
	2	153		3233864	8821449	3827582		2	214		6473483	7166462	3109520
	3	154		3073235	8870991	3849085		3	215		6602191	7065297	3065625
	4	155		2911736	8918035	3869503		4	216		6729044	6962130	3020659
	5	156		+2749410	+8962567	+3888829		5	217		-6854003	+6856984	+2975233
	6	157		2586299	9004577	3907059		6	218		6977030	6749886	2928757
	7	158		2422446	9044054	3924188		7	219		7098089	6640862	2881444
	8	159		2257893	9080984	3940210		8	220		7217145	6520941	2833308
	9	160		2092685	9115352	3955119		9	221		7334161	6417154	2784363
	10	161		+1926869	+9147145	+3968909		10	222		-7449097	+6302528	+2734621
	11	162		1760491	9176349	3981575		11	223		7561912	6186096	2684097
	12	163		1593601	9202954	3993113		12	224		7672569	6067889	2632804
	13	164		1426249	9226951	4003520		13	225		7781033	5947940	2580755
	14	165		1258485	9248333	4012792		14	226		7887270	5826286	2527968
August	15	166		+1090358	+9267094	+4020926	September	15	227		-7991250	+5702962	+2474459
	16	167		0921918	9283227	4027919		16	228		8092938	5578002	2420243
	17	168		0753216	9296727	4033769		17	229		8192298	5451445	2365335
	18	169		0584302	9307590	4038476		18	230		8289302	5323334	2309751
	19	170		0415228	9315812	4042039		19	231		8383924	5193707	2253510
	20	171		+0246047	+9321396	+4044458		20	232		-8476136	+5062600	+2196631
	21	172		0076810	9324342	4045734		21	233		8565911	4930052	2139129
	22	173		-0092434	9324652	4045869		22	234		8653227	4796104	2081018
	23	174		0261636	9322520	4044864		23	235		8738060	4660796	2022314
	24	175		0430748	9317378	4042720		24	236		8820385	4524169	1963037
	25	176		-0599725	+9309806	+4039439		25	237		-8900180	+4386262	+1903207
	26	177		0763520	9299617	4035024		26	238		8977424	4247113	1842837
	27	178		0937085	9286818	4029477		27	239		9052098	4106753	1781940
	28	179		1105374	9271416	4022800		28	240		9124184	3965234	1720534
	29	180		1273343	9253417	4014997		29	241		9193660	3822579	1658637
September	30	181		-1440951	+9232828	+4006072	October	30	242		-9260606	+3678830	+1596263
	31	182		-1608155	+9209654	+3996025		31	243		-9324702	+3534025	+1533427

244 SUN'S COORDINATES, 1863.

Greenwich Mean Noon.		X.	Y.	Z.	Greenwich Mean Noon.		X.	Y.	Z.
Sept. 1	^d 244	— .9386228	+ .3388198	+ .1470149	Nov. 1	^d 305	— .7752102	— .5676496	— .2462071
	2 245	.9445062	.3241388	.1406446		306	.7640822	.5798513	.2515018
	3 246	.9501185	.3003636	.1342333		307	.7527218	.5918757	.2563107
	4 247	.9554576	.2944983	.1277827		308	.7411318	.6037277	.2619520
	5 248	.9605215	.2795467	.1212947		309	.7293153	.6153942	.2670137
	6 249	— .9653082	+ .2645129	+ .1147710		310	— .7172754	— .6265741	— .2719941
	7 250	.9698156	.2494010	.1082134		311	.7050157	.6381636	.2768918
	8 251	.9740418	.2342153	.1016239		312	.6925396	.6492584	.2817053
	9 252	.9779850	.2189604	.0950045		313	.6798508	.6601553	.2864328
	10 253	.9816433	.2036409	.0883570		314	.6669531	.6708500	.2910725
11	254	— .9850154	+ .1882609	+ .0816836	11	315	— .6539504	— .6813388	— .2956226
	12 255	.9881004	.1728253	.0749864		316	.6405471	.6916184	.3000819
	13 256	.9908966	.1573390	.0682673		317	.6270474	.7016856	.3044491
	14 257	.9934027	.1418067	.0615284		318	.6133556	.7115368	.3087228
	15 258	.9956177	.1262333	.0547718		319	.5994764	.7211688	.3129016
	16 259	— .9975411	+ .1106239	+ .0479996		320	— .5854142	— .7305785	— .3169841
	17 260	.9991724	.0949831	.0412137		321	.5711734	.7397630	.3209687
	18 261	1.0005107	.0793155	.0344163		322	.5567585	.7487193	.3248542
	19 262	1.0015558	.0636260	.0276095		323	.5421740	.7574446	.3286306
	20 263	1.0023076	.0479193	.0207952		324	.5274244	.7659364	.3323241
21	264	— 1.0027661	+ .0322001	+ .0130753	21	325	— .5125143	— .7741924	— .3359066
	22 265	1.0029312	.0164730	.0071518		326	.4974483	.7822107	.3393682
	23 266	1.0028028	+ .0007425	+ .0003263		327	.4822308	.7899800	.3427618
	24 267	1.0023812	— .0149870	— .0064979		328	.4668662	.7975252	.3460322
	25 268	1.0016665	.0307113	.0133204		329	.4513589	.8048171	.3491963
	26 269	— 1.0006589	— .0464258	— .0201388		330	— .4357135	— .8118622	— .3522533
	27 270	.9993584	.0621261	.0269513		331	.4199345	.8186583	.3552022
	28 271	.9977653	.0778079	.0337561		332	.4040260	.8252033	.3580424
	29 272	.9958799	.0934673	.0405512		333	.3879926	.8314951	.3607730
	30 273	.9937022	.1090998	.0473348		334	.3718387	.8374317	.3633929
Oct. 1	274	— .9912324	— .1247009	— .0541049	Dec. 1	335	— .3555690	— .8433111	— .3659010
	2 275	.9884705	.1402662	.0608595		336	.3391883	.8488307	.3682962
	3 276	.9854172	.1557916	.0675965		337	.3227013	.8540884	.3705776
	4 277	.9820725	.1712727	.0743141		338	.3061126	.8590824	.3727441
	5 278	.9784367	.1867042	.0810102		339	.2894275	.8638108	.3747948
	6 279	— .9745103	— .2020819	— .0876827		340	— .2726512	— .8682715	— .3767292
	7 280	.9702938	.2174011	.0943298		341	.2557890	.8724627	.3785467
	8 281	.9657880	.2326568	.1009493		342	.2388465	.8763828	.3802465
	9 282	.9609938	.2478443	.1075390		343	.2218293	.8800302	.3818231
	10 283	.9559122	.2629589	.1140066		344	.2047426	.8834033	.3832910
11	284	— .9505445	— .2779856	— .1206201	11	345	— .1875918	— .8865009	— .3846345
	12 285	.9448919	.2929492	.1271076		346	.1703825	.8893221	.3858580
	13 286	.9389559	.3078148	.1335570		347	.1531204	.8918660	.3869613
	14 287	.9327382	.3225875	.1399662		348	.1358113	.8941318	.3879440
	15 288	.9262408	.3372627	.1463331		349	.1184613	.8961186	.3888057
	16 289	— .9194655	— .3518359	— .1526558		350	— .1010762	— .8978258	— .3895464
	17 290	.9124144	.3663026	.1589323		351	.0836616	.8992533	.3901660
	18 291	.9050897	.3806582	.1651605		352	.0662224	.9004010	.3906643
	19 292	.8974938	.3948981	.1713385		353	.0487640	.9012688	.3911013
	20 293	.8896291	.4090178	.1774645		354	.0312119	.9018568	.3912969
21	294	— .8814983	— .4230136	— .1835369	21	355	— .0138117	— .9021650	— .3914313
	22 295	.8731037	.4368815	.1895539		356	+ .0036716	.9021937	.3914444
	23 296	.8644481	.4506171	.1955136		357	.0211529	.9019431	.3913363
	24 297	.8555340	.4642164	.2014143		358	.0396270	.9014133	.3911071
	25 298	.8463636	.4776756	.2072545		359	.0560887	.9006044	.3907567
	26 299	— .8369394	— .4909909	— .2130325		360	+ .0735331	.8995165	.3902852
	27 300	.8272640	.5041586	.2187464		361	.0909552	.8981500	.3896928
	28 301	.8173400	.5171750	.2243946		362	.1083498	.8965052	.3889796
	29 302	.8071702	.5300362	.2299755		363	.1257118	.8945825	.3881453
	30 303	.7967570	.5427382	.2354873		364	.1430360	.8923822	.3871906
31	304	— .7861028	— .5552773	— .2409284	31	365	+ .1603171	— .8899047	— .3861153
	32 305	— .7752102	— .5676496	— .2462071		366	+ .1775498	— .8871504	— .3849198

MOON'S LONGITUDE, &c., 1863. 245

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		FEBRUARY.		MARCH.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	61° 17' 26.1"	+1° 20' 36.2"	105° 17' 32.0"	-2° 36' 0.1"	113° 32' 12.0"	-3° 20' 42.5"
1.5	67 12 12.1	0 48 40.0	111 15 14.8	3 2 28.4	119 32 23.5	3 43 8.0
2.0	73 6 12.0	+0 16 18.2	117 14 57.1	3 27 1.6	125 35 20.9	4 3 11.7
2.5	78 59 48.6	-0 16 10.4	123 16 53.3	3 49 22.3	131 41 24.7	4 20 37.5
3.0	84 53 22.8	0 48 26.4	129 21 14.5	4 9 14.1	137 50 50.7	4 35 9.6
3.5	90 47 13.7	1 20 10.9	135 28 9.2	4 26 20.7	144 3 50.4	4 46 33.3
4.0	96 41 38.3	1 51 4.5	141 37 43.4	4 40 27.1	150 20 30.2	4 54 35.4
4.5	102 36 52.4	2 20 48.2	147 50 1.0	4 51 20.3	156 40 52.3	4 59 4.0
5.0	108 33 10.4	2 49 3.8	154 5 4.4	4 58 48.8	163 4 55.2	4 59 49.8
5.5	114 30 45.6	3 15 32.8	160 22 55.5	5 2 42.7	169 32 33.4	4 56 45.5
6.0	120 29 50.0	3 39 57.9	166 43 35.0	5 2 54.1	176 3 37.7	4 49 48.2
6.5	126 30 36.3	4 2 2.2	173 7 4.5	4 59 18.5	182 37 58.1	4 38 56.4
7.0	132 33 17.0	4 21 20.6	179 33 26.7	4 51 53.6	189 15 22.5	4 24 13.6
7.5	138 38 4.7	4 38 5.8	186 2 43.7	4 40 39.9	195 55 38.0	4 5 47.1
8.0	144 45 11.7	4 51 37.1	192 34 69.4	4 25 40.8	202 38 32.6	3 43 47.9
8.5	150 54 52.3	5 1 51.6	199 10 20.3	4 7 2.5	209 23 54.1	3 18 30.6
9.0	157 7 22.7	5 8 38.3	205 48 53.9	3 44 54.7	216 11 32.9	2 50 13.9
9.5	163 22 58.0	5 11 47.8	212 30 48.0	3 19 20.7	223 1 21.3	2 19 19.6
10.0	169 41 55.2	5 11 12.5	219 16 12.1	2 51 3.5	229 53 13.9	1 46 12.6
10.5	176 4 32.7	5 6 47.3	226 5 15.6	2 19 55.6	236 47 6.1	1 11 20.6
11.0	182 31 10.0	4 58 28.3	232 58 7.3	1 46 27.9	243 42 56.2	-0 35 13.9
11.5	189 2 6.0	4 46 13.4	239 54 55.0	1 11 6.6	250 40 42.5	+0 1 35.7
12.0	195 37 40.7	4 30 4.1	246 55 43.2	-0 34 21.6	257 40 24.1	0 38 34.7
12.5	202 18 12.8	4 10 3.7	254 0 31.5	+0 3 15.7	264 41 59.6	1 15 8.9
13.0	209 3 58.4	3 46 19.5	261 9 14.8	0 41 9.2	271 45 25.8	1 50 43.1
13.5	215 55 11.0	3 19 2.3	268 21 41.5	1 18 40.6	278 50 36.5	2 24 42.7
14.0	222 52 2.5	2 48 27.8	275 37 31.3	1 55 11.4	285 57 22.0	2 56 33.9
14.5	229 54 36.0	2 14 55.8	282 56 16.6	2 30 0.2	293 5 28.5	3 25 44.3
15.0	237 2 49.8	1 38 53.3	290 17 20.5	3 2 27.6	300 14 36.1	3 51 43.7
15.5	244 16 33.0	1 0 49.2	297 39 57.7	3 31 56.3	307 24 20.4	4 14 5.4
16.0	251 35 25.0*	-0 21 20.4	305 3 15.5	3 57 51.7	314 34 12.0	4 32 26.6
16.5	258 58 56.3	+0 18 52.7	312 26 16.7	4 19 45.7	321 43 35.5	4 46 29.0
17.0	266 26 25.5	0 59 6.3	319 47 58.8	4 37 14.9	328 51 52.4	4 56 0.3
17.5	273 57 3.3	1 38 32.5	327 7 20.5	4 50 3.3	335 58 22.2	5 0 53.4
18.0	281 29 48.1	2 16 22.6	334 23 22.1	4 58 2.2	343 2 22.9	5 1 7.7
18.5	289 3 34.0	2 51 50.9	341 35 7.7	5 1 10.3	350 3 14.0	4 56 48.2
19.0	296 37 8.6	3 24 15.4	348 41 49.8	4 59 33.9	357 0 17.4	4 48 5.4
19.5	304 9 16.8	3 52 57.7	355 42 47.9	4 53 25.0	3 52 59.6	4 35 15.1
20.0	311 38 46.6	4 17 26.3	2 37 33.0	4 43 0.8	10 40 53.3	4 18 35.6
20.5	319 4 28.4	4 37 18.3	9 25 46.1	4 28 42.7	17 23 37.5	3 58 33.1
21.0	326 25 19.4	4 52 20.5	16 7 18.8	4 10 53.8	24 0 58.6	3 35 28.9
21.5	333 40 26.6	5 2 27.2	22 42 14.0	3 49 59.7	30 32 51.3	3 9 50.6
22.0	340 49 9.1	5 7 39.5	29 10 40.7	3 26 25.4	36 59 17.4	2 42 4.1
22.5	347 50 56.6	5 8 6.6	35 32 59.8	3 0 36.2	43 20 26.3	2 12 35.9
23.0	354 45 31.9	5 4 0.9	41 49 36.3	2 32 55.9	49 36 33.7	1 41 51.0
23.5	1 32 47.6	4 55 41.1	48 1 1.7	2 3 47.9	55 48 1.4	1 10 13.7
24.0	8 12 49.3	4 43 26.7	54 7 51.6	1 33 34.0	61 55 15.8	0 38 6.4
24.5	14 45 52.4	4 27 40.3	60 10 44.7	1 2 35.1	67 58 48.1	+0 5 50.4
25.0	21 12 18.4	4 8 43.9	66 10 21.6	+0 31 10.1	73 59 12.8	-0 26 14.6
25.5	27 32 35.0	3 47 0.5	72 7 24.7	-0 0 21.9	79 57 6.9	0 57 50.4
26.0	33 47 15.4	3 22 52.0	78 2 36.2	0 31 43.2	85 53 9.5	1 28 39.2
26.5	39 56 56.6	2 56 40.1	83 56 38.1	1 2 37.5	91 48 0.7	1 58 25.1
27.0	46 2 17.1	2 28 45.2	89 50 11.2	1 32 47.7	97 42 21.8	2 26 52.1
27.5	52 3 57.4	1 59 27.2	95 43 55.2	2 1 57.7	103 36 53.4	2 53 45.2
28.0	58 2 37.1	1 29 5.8	101 38 27.5	2 29 50.9	109 32 15.7	3 18 49.7
28.5	63 58 56.5	0 57 58.8	107 34 22.6	2 56 11.6	115 29 7.6	3 41 50.7
29.0	69 53 34.3	+0 26 24.7	113 32 12.0	3 20 42.5	121 28 6.5	4 2 33.0
29.5	75 47 7.5	-0 5 19.0	119 32 23.5	3 43 8.0	127 29 46.4	4 20 42.5
30.0	81 40 11.0	0 36 54.4	125 35 20.9	4 3 11.7	133 34 39.2	4 36 4.7
30.5	87 33 17.2	1 8 4.3	131 41 24.7	4 20 37.5	139 43 12.5	4 48 25.4
31.0	93 26 55.2	1 38 30.2	137 50 50.7	4 35 9.6	145 55 50.1	4 57 30.1
31.5	99 21 32.2	-2 7 54.7	144 3 50.4	-4 46 33.3	152 12 51.0	-5 3 6.2

246 MOON'S LONGITUDE, &c., 1863.

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		MAY.		JUNE.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	158° 34' 21.1	—5° 5' 2.5	193° 0' 41.8	—4° 14' 21.7	243° 45' 30.3	—0° 17' 25.7
1.5	165 0 52.3	5 3 9.0	199 52 6.7	3 50 37.7	251 13 10.6	+0 23 42.8
2.0	171 32 22.5	4 57 18.5	206 48 49.7	3 23 11.0	258 40 41.5	1 4 42.3
2.5	178 7 56.3	4 47 26.8	213 50 27.3	2 52 20.0	266 10 2.9	1 44 44.4
3.0	184 48 23.6	4 33 33.3	220 56 29.2	2 18 29.1	273 40 11.6	2 23 1.5
3.5	191 33 10.1	4 15 41.8	228 6 19.6	1 42 7.6	281 10 4.3	2 58 48.4
4.0	198 21 56.2	3 54 1.3	235 19 18.4	1 3 50.5	288 38 39.1	3 31 24.4
4.5	205 14 18.3	3 28 44.3	242 34 42.2	—0 24 16.8	296 4 58.1	4 0 14.9
5.0	212 9 50.2	3 0 9.3	240 51 46.3	+0 15 51.3	303 28 9.0	4 24 52.0
5.5	219 8 4.5	2 28 39.3	257 9 45.8	0 55 50.2	310 47 26.7	4 44 55.5
6.0	226 8 34.0	1 54 42.0	264 27 57.1	1 34 56.5	318 2 14.4	5 0 12.1
6.5	233 10 51.0	1 18 48.5	271 45 39.0	2 12 27.8	325 12 4.0	5 10 36.1
7.0	240 14 29.9	0 41 32.7	279 2 13.8	2 47 44.7	332 16 35.7	5 16 7.8
7.5	247 19 7.4	—0 3 30.9	286 17 7.6	3 20 11.6	339 15 38.1	5 16 53.3
8.0	254 24 22.8	+0 34 39.8	293 29 51.3	3 49 17.5	346 9 7.0	5 13 3.0
8.5	261 29 57.9	1 12 21.5	300 40 0.4	4 14 36.7	352 57 5.0	5 4 50.8
9.0	268 35 36.6	1 48 57.8	307 47 14.8	4 35 49.0	359 39 39.3	4 52 33.9
9.5	275 41 5.4	2 23 52.8	314 51 18.9	4 52 39.6	6 17 2.1	4 36 31.2
10.0	282 46 12.9	2 56 33.5	321 52 0.9	5 4 59.2	12 40 28.6	4 17 3.4
10.5	289 50 48.1	3 26 28.9	328 49 12.2	5 12 43.3	19 17 16.0	3 54 32.1
11.0	296 54 39.7	3 53 11.7	335 42 47.5	5 15 51.9	25 40 43.3	3 29 19.6
11.5	303 57 37.5	4 16 18.0	342 32 43.4	5 14 29.7	32 0 10.6	3 1 48.6
12.0	310 59 30.1	4 35 28.4	349 18 58.4	5 8 44.6	38 15 58.0	2 32 22.2
12.5	318 0 5.1	4 50 27.0	356 1 32.7	4 58 48.5	44 28 25.5	2 1 23.3
13.0	324 59 7.3	5 1 2.3	2 40 27.4	4 44 55.7	50 37 52.1	1 29 14.6
13.5	331 56 22.0	5 7 8.2	9 15 44.6	4 27 23.3	56 44 36.6	0 56 19.0
14.0	338 51 32.5	5 8 42.9	15 47 26.8	4 6 30.7	62 48 57.0	+0 22 58.8
14.5	345 44 20.6	5 5 49.1	22 15 37.5	3 42 38.9	68 51 9.9	—0 10 24.5
15.0	352 34 27.3	4 58 33.9	28 40 20.6	3 16 10.2	74 51 31.5	0 43 29.5
15.5	359 21 34.2	4 47 8.9	35 1 40.7	2 47 28.2	80 50 17.3	1 15 55.6
16.0	6 5 23.8	4 31 49.1	41 19 43.2	2 16 57.0	86 47 42.5	1 47 23.2
16.5	12 45 39.8	4 12 53.4	47 34 34.6	1 45 1.2	92 44 2.2	2 17 33.7
17.0	19 22 7.5	3 50 43.0	53 46 22.4	1 12 5.2	98 39 31.6	2 46 9.3
17.5	25 54 36.5	3 25 41.6	59 55 15.6	0 38 33.1	104 34 26.1	3 12 53.5
18.0	32 23 0.0	2 58 14.3	66 1 24.8	+0 4 48.3	110 29 2.5	3 37 31.0
18.5	38 47 14.3	2 28 46.2	72 5 2.4	—0 28 46.6	116 23 38.0	3 59 47.7
19.0	45 7 20.0	1 57 43.2	78 6 22.6	1 1 50.2	122 18 31.0	4 19 30.7
19.5	51 23 22.7	1 23 31.5	84 5 41.5	1 34 2.0	128 14 1.6	4 36 28.1
20.0	57 35 32.7	0 52 36.3	90 3 17.5	2 5 3.3	134 10 31.1	4 50 29.4
20.5	63 44 4.1	+0 19 21.4	95 59 31.1	2 34 36.2	140 8 22.6	5 1 25.1
21.0	69 49 15.0	—0 13 51.2	101 54 45.1	3 2 24.5	146 8 0.5	5 9 6.6
21.5	75 51 27.6	0 46 40.3	107 49 24.1	3 28 12.8	152 9 51.3	5 13 26.2
22.0	81 51 7.4	1 18 46.1	113 43 54.8	3 51 47.2	158 14 22.6	5 14 17.7
22.5	87 48 42.6	1 49 50.6	119 38 45.8	4 12 54.6	164 22 3.0	5 11 35.6
23.0	93 44 44.8	2 19 36.4	125 34 27.4	4 31 22.6	170 33 22.5	5 5 15.6
23.5	99 39 46.9	2 47 48.0	131 31 31.2	4 46 59.8	176 48 50.8	4 55 14.8
24.0	105 34 24.6	3 14 10.5	137 30 30.2	4 59 35.2	183 8 57.9	4 41 31.9
24.5	111 29 14.4	3 38 29.5	143 31 57.7	5 8 58.7	189 34 12.9	4 24 7.7
25.0	117 24 53.1	4 0 31.5	149 36 27.5	5 15 0.4	196 5 2.9	4 3 5.1
25.5	123 21 58.6	4 20 3.3	155 44 33.2	5 17 31.3	202 41 52.7	3 38 30.3
26.0	129 21 8.8	4 36 52.1	161 56 47.6	5 16 23.2	209 25 2.7	3 10 32.8
26.5	135 22 59.8	4 53 45.1	168 13 42.1	5 11 28.9	216 14 48.7	2 39 26.5
27.0	141 28 7.3	5 1 29.9	174 35 45.8	5 2 42.5	223 11 19.6	2 5 30.1
27.5	147 37 4.4	5 8 54.6	181 3 24.6	4 50 0.0	230 14 36.3	1 29 7.4
28.0	153 50 21.8	5 12 47.5	187 37 0.5	4 33 20.2	237 24 30.4	0 50 48.1
28.5	160 8 26.4	5 12 58.5	194 16 50.5	4 12 44.7	244 40 43.0	—0 11 7.5
29.0	166 31 40.9	5 9 18.1	201 3 5.3	3 48 19.2	252 2 44.4	+0 29 14.0
29.5	173 0 22.8	5 1 39.3	207 55 48.4	3 20 14.0	259 29 53.0	1 9 31.5
30.0	179 34 44.2	4 49 57.4	214 54 55.0	2 48 44.2	267 1 16.7	1 48 57.3
30.5	186 14 51.0	4 34 10.4	222 0 11.9	2 14 11.9	274 35 53.5	2 26 42.5
31.0	193 0 41.8	4 14 21.7	229 11 16.2	1 37 4.7	282 12 33.2	3 1 59.3
31.5	199 52 6.7	—3 50 37.7	236 27 35.9	—0 57 56.2	289 50 0.4	+3 34 3.0

MOON'S LONGITUDE, &c., 1863. 247

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		AUGUST.		SEPTEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	232° 12' 33.2	+3° 1' 59.3	336° 2' 31.9	+5° 3' 40.2	26° 47' 31.5	+2° 52' 25.2
1.5	239 50 0.4	3 34 3.0	343 24 12.9	5 0 16.5	33 28 1.2	2 22 23.0
2.0	207 26 56.7	4 2 14.6	350 39 29.3	4 52 3.5	40 1 37.5	1 50 55.3
2.5	305 2 5.0	4 26 2.0	357 47 46.1	4 39 23.0	46 28 41.9	1 18 30.7
3.0	312 34 11.8	4 45 1.3	4 48 41.6	4 22 40.7	52 49 42.1	0 45 35.7
3.5	320 2 10.8	4 58 57.9	11 42 6.7	4 2 24.0	59 5 11.2	+0 12 34.7
4.0	327 25 5.1	5 7 45.3	18 28 4.9	3 39 2.3	65 15 45.4	-0 20 10.2
4.5	334 42 8.7	5 11 25.8	25 6 49.0	3 13 5.0	71 22 3.5	0 52 19.0
5.0	341 52 48.0	5 10 8.1	31 38 40.3	2 45 0.6	77 24 45.7	1 23 33.2
5.5	348 56 41.2	5 4 7.1	38 4 6.9	2 15 16.3	83 24 32.3	1 53 36.1
6.0	355 53 38.3	4 53 41.7	44 23 40.8	1 44 18.0	89 22 3.6	2 22 12.1
6.5	2 43 39.5	4 39 14.0	50 37 57.7	1 12 29.8	95 17 58.4	2 49 6.8
7.0	9 26 54.1	4 21 8.3	56 47 35.9	0 40 14.5	101 12 54.2	3 14 6.3
7.5	16 3 38.5	3 59 49.2	62 53 14.3	+0 7 53.0	107 7 26.5	3 36 57.6
8.0	22 34 15.1	3 35 42.1	68 55 30.9	-0 24 14.9	113 2 8.3	3 57 28.4
8.5	28 50 10.2	3 9 12.0	74 55 3.0	0 55 50.4	118 57 29.7	4 15 26.6
9.0	35 18 53.4	2 40 43.4	80 52 26.6	1 26 36.0	124 53 57.6	4 30 41.0
9.5	41 33 55.8	2 10 40.0	86 48 16.2	1 56 14.9	130 51 55.5	4 43 1.1
10.0	47 44 49.1	1 39 24.8	92 43 3.7	2 24 30.8	136 51 43.7	4 52 16.9
10.5	53 52 5.3	1 7 19.9	98 37 18.1	2 51 8.3	142 53 39.0	4 58 19.9
11.0	59 56 15.4	0 34 46.7	104 31 25.8	3 15 52.4	148 57 55.0	5 1 2.6
11.5	65 57 49.2	+0 2 5.7	110 25 50.1	3 38 29.0	155 4 41.9	5 0 19.4
12.0	71 57 14.6	-0 30 23.1	116 20 51.6	3 58 44.5	161 14 6.8	4 56 6.1
12.5	77 54 57.8	1 2 21.4	122 16 47.9	4 16 26.2	167 26 14.3	4 48 21.0
13.0	83 51 22.8	1 33 27.5	128 13 54.3	4 31 22.1	173 41 6.8	4 37 4.8
13.5	89 46 51.2	2 3 26.4	134 12 23.6	4 43 21.4	179 58 45.0	4 22 20.6
14.0	95 41 43.0	2 31 59.7	140 12 26.4	4 52 14.8	186 19 8.7	4 4 14.7
14.5	101 36 16.0	2 58 50.8	146 14 11.7	4 57 54.3	192 42 17.5	3 42 55.9
15.0	107 30 46.4	3 23 43.9	152 17 47.4	5 0 13.5	199 8 11.2	3 18 36.0
15.5	113 25 28.9	3 46 24.2	158 23 20.7	4 59 7.9	205 36 50.4	2 51 28.8
16.0	119 20 37.3	4 6 38.0	164 30 58.5	4 54 34.8	212 8 16.3	2 21 55.0
16.5	125 16 24.7	4 24 12.7	170 40 48.0	4 46 33.9	218 42 31.7	1 50 11.8
17.0	131 13 3.8	4 38 56.9	176 52 57.3	4 35 6.5	225 19 41.4	1 16 43.0
17.5	137 10 47.4	4 50 40.4	183 7 36.0	4 20 16.6	231 59 51.5	0 41 53.6
18.0	143 9 48.5	4 59 14.7	189 24 55.3	4 2 10.0	238 43 9.5	-0 6 11.0
18.5	149 10 21.6	5 4 32.7	195 45 8.3	3 40 55.1	245 29 43.7	+0 29 55.9
19.0	155 12 41.6	5 6 28.4	202 8 29.8	3 16 42.5	252 19 41.7	1 5 56.3
19.5	161 17 5.4	5 4 57.8	208 35 16.5	2 49 45.2	259 13 10.0	1 41 18.2
20.0	167 23 51.3	4 59 58.1	215 5 46.6	2 20 18.6	266 10 4.1	2 15 28.8
20.5	173 33 19.6	4 51 28.3	221 40 19.2	1 48 40.9	273 10 56.1	2 47 54.6
21.0	179 45 52.1	4 39 28.7	228 19 13.6	1 15 12.8	280 15 13.9	3 18 2.5
21.5	186 1 52.3	4 24 1.9	235 2 48.4	0 40 17.8	287 22 59.7	3 45 19.9
22.0	192 21 45.5	4 5 11.8	241 51 20.9	-0 4 22.5	294 33 58.9	4 9 16.1
22.5	198 45 56.8	3 43 5.0	248 45 4.9	+0 32 3.8	301 47 49.7	4 29 22.6
23.0	205 14 52.2	3 17 50.2	255 44 10.3	1 8 28.6	309 4 3.8	4 45 14.7
23.5	211 48 57.6	2 49 39.3	262 48 40.5	1 44 17.3	316 22 4.9	4 56 32.3
24.0	218 28 36.3	2 18 46.9	269 58 31.5	2 18 53.0	323 41 9.7	5 3 0.6
24.5	225 14 10.0	1 45 31.4	277 13 30.3	2 51 37.5	331 0 29.5	5 4 31.7
25.0	232 5 55.8	1 10 15.1	284 33 13.7	3 21 52.1	338 19 11.0	5 1 4.0
25.5	239 4 5.5	-0 33 24.2	291 57 7.0	3 48 50.1	345 36 19.2	4 52 43.3
26.0	246 8 43.7	+0 4 30.1	299 24 24.9	4 12 23.3	352 50 59.1	4 39 42.2
26.5	253 19 46.1	0 42 52.1	306 54 11.5	4 31 33.8	0 2 18.6	4 22 19.4
27.0	260 36 57.7	1 21 2.8	314 25 22.2	4 46 4.9	7 9 20.9	4 0 59.5
27.5	267 59 52.2	1 58 19.4	321 56 46.0	4 55 38.4	14 11 52.1	3 36 10.9
28.0	275 27 50.9	2 33 57.4	329 27 8.7	5 0 4.0	21 8 52.2	3 8 25.1
28.5	283 0 2.7	3 7 11.9	336 55 15.8	4 59 19.9	28 0 5.7	2 38 15.1
29.0	290 35 25.6	3 37 19.8	344 19 56.4	4 53 32.6	34 45 18.0	2 6 14.3
29.5	298 12 47.4	4 3 41.2	351 40 5.7	4 42 56.5	41 24 23.1	1 32 55.5
30.0	305 50 49.3	4 25 42.2	358 54 48.4	4 27 52.6	47 57 24.0	0 58 49.9
30.5	313 28 9.0	4 42 55.9	6 3 20.2	4 8 47.0	54 24 31.7	+0 24 26.4
31.0	321 3 23.7	4 55 4.5	13 5 9.1	3 46 9.2	60 46 3.9	-0 9 48.1
31.5	328 35 14.9	+5 1 59.3	19 59 55.3	+3 23 31.2	67 2 24.5	-0 43 29.7

248 MOON'S LONGITUDE, &c., 1863.

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		NOVEMBER.		DECEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	60° 46' 3.9	—0° 9' 48.1	105° 13' 24.4	—3° 52' 32.3	136° 53' 13.9	—5° 10' 56.1
1.5	67 2 24.5	0 43 29.7	111 10 49.8	4 13 28.9	142 49 19.6	5 15 23.7
2.0	73 14 1.8	1 16 16.5	117 7 8.6	4 31 38.0	148 46 27.6	5 16 29.2
2.5	79 21 28.1	1 47 49.2	123 2 56.2	4 46 51.2	154 45 11.9	5 14 9.8
3.0	85 25 18.3	2 17 50.8	128 58 48.7	4 59 0.7	160 46 7.7	5 8 23.5
3.5	91 26 9.7	2 46 6.0	134 55 22.5	5 7 59.7	166 49 50.4	4 59 9.3
4.0	97 24 40.6	3 12 21.0	140 53 13.9	5 13 41.8	172 56 55.2	4 46 27.1
4.5	103 21 29.8	3 36 23.2	146 52 58.1	5 16 1.1	179 7 56.2	4 30 18.2
5.0	109 17 16.3	3 58 1.0	152 55 8.9	5 14 52.4	185 23 26.3	4 10 45.8
5.5	115 12 38.3	4 17 3.8	159 0 18.2	5 10 11.9	191 43 55.5	3 47 54.9
6.0	121 8 12.7	4 33 21.7	165 8 55.7	5 1 56.4	198 9 50.8	3 21 53.2
6.5	127 4 34.7	4 46 44.8	171 21 28.0	4 50 4.3	204 41 34.7	2 52 51.7
7.0	133 2 17.7	4 57 4.5	177 38 18.3	4 34 36.2	211 19 24.4	2 21 5.1
7.5	139 1 52.2	5 4 12.2	183 59 45.3	4 15 34.7	218 3 30.6	1 46 52.2
8.0	145 3 45.9	5 8 0.5	190 26 3.2	3 53 5.4	224 53 56.7	1 10 36.6
8.5	151 8 22.8	5 8 22.8	196 57 20.6	3 27 17.5	231 50 37.6	—0 32 46.8
9.0	157 16 3.8	5 5 13.8	203 33 41.0	2 58 23.7	238 53 19.5	+0 6 4.2
9.5	163 27 5.7	4 58 29.8	210 15 2.3	2 26 41.2	246 1 39.3	0 45 18.9
10.0	169 41 41.2	4 48 9.0	217 1 16.5	1 52 31.6	253 15 4.5	1 24 16.2
10.5	175 59 58.8	4 34 12.0	223 52 9.7	1 16 20.7	260 32 53.7	2 2 13.0
11.0	182 22 3.2	4 16 42.4	230 47 22.5	0 38 39.0	267 54 18.0	2 38 24.9
11.5	188 47 54.9	3 55 46.8	237 46 30.5	—0 0 0.5	275 18 21.9	3 12 8.6
12.0	195 17 31.1	3 31 35.2	244 49 5.6	+0 38 57.6	282 44 5.9	3 42 43.7
12.5	201 50 45.5	3 4 21.3	251 54 36.5	1 17 36.3	290 10 28.0	4 9 34.0
13.0	208 27 29.3	2 34 22.7	259 2 29.9	1 55 15.6	297 36 26.6	4 32 9.1
13.5	215 7 31.7	2 2 0.5	266 12 10.0	2 31 15.6	305 1 2.6	4 50 5.6
14.0	221 50 40.4	1 27 39.3	273 23 5.9	3 4 58.6	312 23 21.7	5 3 7.6
14.5	228 36 43.2	0 51 46.8	280 34 38.6	3 35 48.8	319 42 36.4	5 11 6.7
15.0	235 25 27.5	—0 14 53.3	287 46 17.6	4 3 14.6	326 58 7.0	5 14 1.9
15.5	242 16 41.2	+0 22 28.6	294 57 31.9	4 26 48.8	334 9 22.3	5 11 58.5
16.0	249 10 12.9	0 59 45.4	302 7 54.4	4 46 9.4	341 16 0.0	5 5 7.7
16.5	256 5 51.8	1 36 22.3	309 16 59.7	5 0 59.4	348 17 46.2	4 53 45.3
17.0	263 3 28.4	2 11 44.8	316 24 27.1	5 11 7.5	355 14 34.4	4 38 11.0
17.5	270 2 53.9	2 45 19.0	323 29 57.8	5 16 27.9	2 6 25.0	4 18 47.0
18.0	277 3 59.1	3 16 32.3	330 33 16.3	5 16 59.7	8 53 23.5	3 55 58.0
18.5	284 6 34.5	3 44 53.9	337 34 9.8	5 12 47.2	15 35 40.0	3 30 9.5
19.0	291 10 29.9	4 9 55.5	344 32 27.3	5 3 59.2	22 13 27.3	3 1 48.1
19.5	298 15 34.0	4 31 12.0	351 28 0.0	4 50 48.4	28 47 0.6	2 31 20.7
20.0	305 21 33.1	4 48 21.8	358 20 40.2	4 33 31.6	35 16 36.1	1 59 14.5
20.5	312 28 11.7	5 1 7.3	5 10 22.2	4 12 28.5	41 42 30.5	1 25 56.1
21.0	319 35 11.4	5 9 15.6	11 56 59.7	3 48 1.8	48 5 0.2	0 51 51.9
21.5	326 42 10.9	5 12 38.4	18 40 28.4	3 20 36.5	54 24 20.9	+0 17 27.8
22.0	333 48 46.7	5 11 13.0	25 20 44.1	2 50 39.6	60 40 47.1	—0 16 51.5
22.5	340 54 32.2	5 5 1.7	31 57 44.1	2 18 39.3	66 54 32.3	0 50 41.8
23.0	347 58 59.4	4 54 12.3	38 31 25.3	1 45 4.3	73 5 48.6	1 23 40.4
23.5	355 1 38.6	4 38 58.0	45 1 45.8	1 10 23.7	79 14 47.0	1 55 26.6
24.0	2 2 0.1	4 19 36.8	51 28 44.4	+0 35 6.8	85 21 37.6	2 25 37.4
24.5	8 59 34.5	3 56 31.1	57 52 20.9	—0 0 18.1	91 26 29.7	2 53 57.4
25.0	15 53 53.9	3 30 6.9	64 12 36.5	0 35 24.0	97 29 32.4	3 20 8.8
25.5	22 44 33.3	3 0 53.3	70 29 34.4	1 9 45.2	103 30 55.1	3 43 56.7
26.0	29 31 10.7	2 29 21.4	76 43 19.8	1 42 58.3	109 30 47.7	4 5 8.1
26.5	36 13 28.6	1 56 3.0	82 54 0.3	2 14 41.6	115 29 20.9	4 23 31.9
27.0	42 51 14.3	1 21 30.4	89 1 46.1	2 44 35.7	121 26 47.0	4 38 58.7
27.5	49 24 20.1	0 46 14.9	95 6 49.9	3 12 23.3	127 23 19.7	4 51 21.1
28.0	55 52 44.0	+0 10 46.8	101 9 26.6	3 37 49.5	133 19 14.8	5 0 33.1
28.5	62 16 28.8	—0 24 25.9	107 9 54.0	4 0 41.4	139 14 50.2	5 6 30.4
29.0	68 35 42.9	0 58 57.2	113 8 32.3	4 20 48.1	145 10 26.4	5 9 10.1
29.5	74 50 39.4	1 32 23.6	119 5 44.6	4 37 59.8	151 6 26.1	5 8 30.5
30.0	81 1 35.7	2 4 24.3	125 1 56.7	4 52 9.2	157 3 14.5	5 4 31.2
30.5	87 8 53.6	2 34 40.7	130 57 36.7	5 3 9.8	163 1 19.2	4 57 12.8
31.0	93 12 58.3	3 2 56.6	136 53 13.9	5 10 56.1	169 1 10.3	4 46 36.9
31.5	99 14 18.1	—3 28 57.9	142 49 19.6	—5 15 23.7	175 3 19.8	—4 32 46.2

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON.

250 OBLIQUITY OF THE ECLIPTIC, &c.

Sidereal 0 ^h .	Apparent Obliquity.	Equation of Equinoxes.		Precession of Equinoxes in Longitude.	The Sun's		Mean Longitude of Moon's Ascending Node.
		In Longitude.	In R. A.		Aberration.	Hor. Parallax.	
1863.	23° 27'						
0	22.09	+17.19	+1.05	0.00	-20.80	8.72	254° 46.8
10	22.09	17.56	1.07	1.37	20.79	8.72	254 15.1
20	22.15	17.83	1.09	2.74	20.77	8.72	253 43.4
30	22.24	17.96	1.10	4.12	20.74	8.71	253 11.7
40	22.34	17.93	1.10	5.49	20.71	8.69	252 40.0
50	22.42	17.73	1.08	6.66	20.67	8.67	252 8.3
60	22.48	17.40	1.06	8.23	20.63	8.65	251 36.6
70	22.47	16.98	1.04	9.60	20.56	8.63	251 5.0
80	22.41	16.50	1.01	10.98	20.51	8.61	250 33.3
90	22.28	16.02	0.98	12.35	20.45	8.58	250 1.6
100	22.09	15.60	0.95	13.72	20.39	8.56	249 30.0
110	21.85	15.27	0.93	15.09	20.34	8.53	248 58.3
120	21.59	15.05	0.92	16.47	20.29	8.51	248 26.6
130	21.31	14.98	0.92	17.84	20.24	8.49	247 54.9
140	21.05	15.04	0.92	19.21	20.19	8.47	247 23.2
150	20.81	15.21	0.93	20.59	20.16	8.46	246 51.5
160	20.62	15.48	0.95	21.95	20.13	8.45	246 19.8
170	20.48	15.80	0.97	23.33	20.11	8.44	245 48.1
180	20.41	16.13	0.99	24.70	20.11	8.44	245 16.4
190	20.39	16.42	1.00	26.07	20.10	8.44	244 44.7
200	20.42	16.63	1.02	27.44	20.12	8.44	244 13.0
210	20.49	16.74	1.02	28.81	20.14	8.45	243 41.4
220	20.57	16.72	1.02	30.19	20.17	8.46	243 9.7
230	20.66	16.56	1.01	31.56	20.20	8.48	242 38.0
240	20.73	16.27	0.99	32.93	20.24	8.50	242 6.3
250	20.77	15.87	0.97	34.31	20.29	8.52	241 34.6
260	20.75	15.39	0.94	35.68	20.35	8.54	241 2.9
270	20.67	14.89	0.91	37.05	20.41	8.56	240 31.3
280	20.52	14.39	0.88	38.42	20.47	8.59	239 59.6
290	20.32	13.97	0.85	39.79	20.53	8.61	239 27.8
300	20.08	13.66	0.83	41.16	20.59	8.64	238 56.1
310	19.80	13.48	0.82	42.54	20.64	8.60	238 24.4
320	19.52	13.46	0.82	43.91	20.69	8.68	237 52.7
330	19.26	13.60	0.83	45.28	20.73	8.70	237 21.0
340	19.04	13.86	0.85	46.65	20.76	8.71	236 49.3
350	18.88	14.22	0.87	48.02	20.78	8.72	236 17.6
360	18.79	14.60	0.89	49.40	20.79	8.72	235 46.0
370	18.76	+14.96	+0.91	50.77	-20.78	8.72	235 14.3
Mean Obliquity, 1863.0, 23° 27' 24.96 Precession for 1863.5, 50.2555 Log. Precession in a Sidereal Day, 9.13741 Log. Precession in a Solar Day, 9.13860							Daily Motion. 3.169

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR CORRECTING THE PLACES OF THE FIXED STARS.

Date.	A.	B.	C.	D.	Date.	A.	B.	C.	D.
Jan. 1	-0.56827	+1.30197	+9.53614	+0.45800	Mar. 1	-1.24922	+0.81954	+9.70615	+0.38137
2	0.60497	1.30034	9.54060	0.45803	2	1.25174	0.79662	9.70782	0.38074
3	0.63869	1.29657	9.54499	0.45798	3	1.25411	0.77230	9.70947	0.38021
4	0.66985	1.29666	9.54930	0.45785	4	1.25633	0.74640	9.71110	0.37979
5	0.69880	1.29459	9.55356	0.45764	5	1.25841	0.71873	9.71271	0.37948
6	-0.72580	+1.29238	+9.55775	+0.45732	6	-1.26034	+0.68906	+9.71430	+0.37927
7	0.75109	1.29003	9.56188	0.45690	7	1.26214	0.65708	9.71587	0.37916
8	0.77486	1.28752	9.56598	0.45639	8	1.26379	0.62243	9.71742	0.37916
9	0.79727	1.28485	9.56996	0.45579	9	1.26531	0.58466	9.71896	0.37927
10	0.81844	1.28204	9.57390	0.45510	10	1.26669	0.54315	9.72048	0.37950
11	-0.83850	+1.27907	+9.57779	+0.45434	11	-1.26793	+0.49713	+9.72199	+0.37985
12	0.85755	1.27593	9.58163	0.45351	12	1.26904	0.44552	9.72349	0.38032
13	0.87566	1.27264	9.58541	0.45260	13	1.27001	0.38684	9.72498	0.38090
14	0.89291	1.26918	9.58911	0.45162	14	1.27085	0.31885	9.72644	0.38158
15	0.90936	1.26556	9.59276	0.45066	15	1.27156	0.23809	9.72790	0.38238
16	-0.92508	+1.26177	+9.59636	+0.44942	16	-1.27213	+0.13866	+9.72934	+0.38329
17	0.94012	1.25781	9.59990	0.44823	17	1.27258	0.00942	9.73079	0.38432
18	0.95453	1.25367	9.60337	0.44699	18	1.27289	9.82452	9.73222	0.38547
19	0.96833	1.24936	9.60679	0.44567	19	1.27307	+9.49591	9.73365	0.38675
20	0.98157	1.24486	9.61016	0.44429	20	1.27312	-8.61242	9.73507	0.38814
21	-0.99428	+1.24019	+9.61346	+0.44286	21	-1.27304	-9.59658	+9.73648	+0.38964
22	1.00650	1.23532	9.61671	0.44137	22	1.27283	9.87427	9.73789	0.39125
23	1.01825	1.23026	9.61992	0.43984	23	1.27249	0.04214	9.73930	0.39296
24	1.02955	1.22500	9.62307	0.43826	24	1.27202	0.16273	9.74071	0.39478
25	1.04043	1.21954	9.62617	0.43661	25	1.27142	0.25686	9.74211	0.39669
26	-1.05091	+1.21388	+9.62921	+0.43492	26	-1.27069	-0.33401	+9.74351	+0.39870
27	1.06100	1.20801	9.63219	0.43321	27	1.26983	0.39936	9.74492	0.40081
28	1.07072	1.20192	9.63512	0.43147	28	1.26884	0.45600	9.74632	0.40303
29	1.08010	1.19560	9.63800	0.42969	29	1.26771	0.50594	9.74773	0.40536
30	1.08914	1.18906	9.64083	0.42789	30	1.26646	0.55060	9.74914	0.40780
31	-1.09786	+1.18228	+9.64361	+0.42606	31	-1.26508	-0.59094	+9.75054	+0.41032
Feb. 1	1.10628	1.17526	9.64634	0.42422	Apr. 1	1.26356	0.62771	9.75196	0.41291
2	1.11439	1.16799	9.64902	0.42236	2	1.26191	0.66148	9.75339	0.41557
3	1.12222	1.16045	9.65166	0.42048	3	1.26012	0.69267	9.75481	0.41832
4	1.12977	1.15265	9.65425	0.41860	4	1.25820	0.72163	9.75624	0.42116
5	-1.13707	+1.14457	+9.65679	+0.41672	5	-1.25615	-0.74865	+9.75767	+0.42406
6	1.14411	1.13620	9.65929	0.41486	6	1.25395	0.77395	9.75910	0.42703
7	1.15040	1.12753	9.66174	0.41298	7	1.25162	0.79772	9.76054	0.43006
8	1.15745	1.11855	9.66414	0.41111	8	1.24915	0.82013	9.76200	0.43316
9	1.16376	1.10925	9.66650	0.40925	9	1.24654	0.84131	9.76346	0.43632
10	-1.16985	+1.09960	+9.66883	+0.40741	10	-1.24379	-0.86137	+9.76496	+0.43954
11	1.17572	1.08960	9.67112	0.40559	11	1.24089	0.88041	9.76642	0.44279
12	1.18138	1.07923	9.67336	0.40379	12	1.23785	0.89863	9.76791	0.44610
13	1.18683	1.06847	9.67556	0.40203	13	1.23466	0.91579	9.76941	0.44945
14	1.19208	1.05730	9.67772	0.40031	14	1.23131	0.93226	9.77093	0.45285
15	-1.19712	+1.04571	+9.67985	+0.39863	15	-1.22782	-0.94800	+9.77244	+0.45629
16	1.20198	1.03366	9.68194	0.39698	16	1.22417	0.96305	9.77396	0.45975
17	1.20665	1.02113	9.68398	0.39538	17	1.22037	0.97747	9.77549	0.46323
18	1.21113	1.00811	9.68600	0.39384	18	1.21641	0.99130	9.77705	0.46673
19	1.21543	0.99454	9.68799	0.39235	19	1.21229	1.00458	9.77862	0.47025
20	-1.21956	+0.98040	+9.68994	+0.39092	20	-1.20801	-1.01733	+9.78021	+0.47379
21	1.22351	0.96565	9.69186	0.38956	21	1.20355	1.02968	9.78181	0.47735
22	1.22729	0.95026	9.69374	0.38826	22	1.19892	1.04137	9.78341	0.48093
23	1.23090	0.93418	9.69559	0.38703	23	1.19411	1.05272	9.78502	0.48451
24	1.23435	0.91735	9.69741	0.38587	24	1.18914	1.06366	9.78664	0.48809
25	-1.23764	+0.89971	+9.69921	+0.38478	25	-1.18309	-1.07419	+9.78827	+0.49168
26	1.24077	0.88119	9.70099	0.38380	26	1.17864	1.08435	9.78993	0.49527
27	1.24374	0.86172	9.70274	0.38290	27	1.17310	1.09415	9.79160	0.49885
28	1.24656	0.84120	9.70446	0.38209	28	1.16738	1.10360	9.79327	0.50241
29	1.24922	0.81954	9.70615	0.38137	29	1.16145	1.11272	9.79495	0.50595
30	-1.25174	+0.79662	+9.70782	+0.38074	30	-1.15532	-1.12153	+9.79665	+0.50949
31	-1.25411	+0.77230	+9.70947	+0.38021	31	-1.14898	-1.13005	+9.79837	+0.51302

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR CORRECTING THE PLACES OF THE FIXED STARS.

Date.	A.	B.	C.	D.	Date.	A.	B.	C.	D.
May 1	-1.14898	-1.13005	+9.79837	+0.51302	July 1	+0.50327	-1.30423	+9.91340	+0.63664
2	1.14242	1.13827	9.90011	0.51653	2	0.54322	1.30292	9.91517	0.63679
3	1.13563	1.14621	9.90184	0.52001	3	0.57969	1.30149	9.91692	0.63688
4	1.12862	1.15388	9.90358	0.52347	4	0.61322	1.29993	9.91865	0.63691
5	1.12137	1.16130	9.90535	0.52692	5	0.64424	1.29825	9.92040	0.63689
6	-1.11388	-1.16846	+9.80712	+0.53035	6	+0.67308	-1.29644	+9.92212	+0.63681
7	1.10613	1.17539	9.90691	0.53374	7	0.70001	1.29450	9.92383	0.63669
8	1.09811	1.18209	9.91071	0.53708	8	0.72526	1.29243	9.92552	0.63651
9	1.08982	1.18855	9.91251	0.54038	9	0.74901	1.29023	9.92720	0.63629
10	1.08125	1.19480	9.91432	0.54365	10	0.77142	1.28790	9.92886	0.63601
11	-1.07238	-1.20084	+9.81615	+0.54688	11	+0.79262	-1.28543	+9.93051	+0.63568
12	1.06321	1.20666	9.91799	0.55007	12	0.81272	1.28283	9.93214	0.63530
13	1.05371	1.21229	9.91984	0.55322	13	0.83182	1.28009	9.93376	0.63487
14	1.04388	1.21773	9.92170	0.55633	14	0.85000	1.27721	9.93536	0.63439
15	1.03370	1.22297	9.92357	0.55940	15	0.86733	1.27419	9.93694	0.63387
16	-1.02316	-1.22802	+9.82545	+0.56244	16	+0.88389	-1.27103	+9.93850	+0.63332
17	1.01223	1.23290	9.92733	0.56541	17	0.89972	1.26773	9.94006	0.63272
18	1.00090	1.23760	9.92923	0.56832	18	0.91488	1.26427	9.94160	0.63206
19	0.98914	1.24213	9.93113	0.57118	19	0.92942	1.26066	9.94311	0.63136
20	0.97694	1.24648	9.93305	0.57398	20	0.94337	1.25690	9.94462	0.63063
21	-0.96426	-1.25067	+9.83497	+0.57673	21	+0.95676	-1.25300	+9.94610	+0.62987
22	0.95108	1.25469	9.93689	0.57944	22	0.96964	1.24893	9.94757	0.62908
23	0.93737	1.25856	9.93881	0.58209	23	0.98204	1.24470	9.94903	0.62827
24	0.92309	1.26226	9.94074	0.58468	24	0.99398	1.24031	9.95047	0.62742
25	0.90820	1.26583	9.94268	0.58721	25	1.00548	1.23575	9.95189	0.62653
26	-0.89267	-1.26923	+9.84461	+0.58969	26	+1.01656	-1.23101	+9.95329	+0.62561
27	0.87644	1.27248	9.94656	0.59211	27	1.02726	1.22611	9.95468	0.62467
28	0.85947	1.27560	9.94851	0.59446	28	1.03758	1.22102	9.95604	0.62369
29	0.84168	1.27856	9.95047	0.59675	29	1.04755	1.21575	9.95740	0.62269
30	0.82301	1.28138	9.95243	0.59900	30	1.05717	1.21029	9.95873	0.62169
31	-0.80338	-1.28407	+9.85439	+0.60117	31	+1.06647	-1.20464	+9.96005	+0.62065
June 1	0.78270	1.28662	9.95635	0.60329	Aug. 1	1.07546	1.19879	9.96135	0.61969
2	0.76087	1.28903	9.95830	0.60533	2	1.08416	1.19273	9.96264	0.61853
3	0.73775	1.29131	9.96025	0.60730	3	1.09256	1.18646	9.96391	0.61746
4	0.71322	1.29345	9.96221	0.60921	4	1.10069	1.17998	9.96516	0.61637
5	-0.68710	-1.29546	+9.86417	+0.61105	5	+1.10856	-1.17327	+9.96639	+0.61527
6	0.65917	1.29734	9.96613	0.61285	6	1.11616	1.16633	9.96761	0.61416
7	0.62921	1.29910	9.96808	0.61458	7	1.12352	1.15915	9.96882	0.61303
8	0.59689	1.30072	9.97004	0.61624	8	1.13064	1.15172	9.97001	0.61190
9	0.56185	1.30222	9.97199	0.61783	9	1.13753	1.14404	9.97118	0.61078
10	-0.52361	-1.30360	+9.87394	+0.61935	10	+1.14419	-1.13609	+9.97234	+0.60966
11	0.48155	1.30484	9.87588	0.62082	11	1.15064	1.12787	9.97347	0.60855
12	0.43483	1.30597	9.87783	0.62222	12	1.15687	1.11936	9.97459	0.60743
13	0.38235	1.30697	9.87977	0.62356	13	1.16290	1.11066	9.97570	0.60634
14	0.32254	1.30785	9.88170	0.62482	14	1.16873	1.10144	9.97679	0.60525
15	-0.25302	-1.30860	+9.88363	+0.62601	15	+1.17436	-1.09199	+9.97786	+0.60417
16	0.17004	1.30923	9.88555	0.62715	16	1.17980	1.08221	9.97892	0.60310
17	0.06726	1.30975	9.88747	0.62823	17	1.18505	1.07207	9.97997	0.60204
18	9.93222	1.31014	9.88937	0.62923	18	1.19012	1.06156	9.98100	0.60101
19	9.73505	1.31041	9.89128	0.63017	19	1.19501	1.05067	9.98201	0.60000
20	-9.36367	-1.31056	+9.89317	+0.63105	20	+1.19973	-1.03937	+9.98301	+0.59901
21	+8.90983	1.31059	9.89506	0.63187	21	1.20427	1.02763	9.98400	0.59806
22	9.50490	1.31049	9.89693	0.63263	22	1.20866	1.01543	9.98499	0.59711
23	9.04850	1.31028	9.89880	0.63332	23	1.21287	1.00275	9.98595	0.59621
24	8.50746	1.30996	9.90066	0.63394	24	1.21692	0.98955	9.98689	0.59533
25	+0.12345	-1.30950	+9.90251	+0.63451	25	+1.22082	-0.97581	+9.98782	+0.59449
26	0.21432	1.30892	9.90435	0.63502	26	1.22457	0.96150	9.98875	0.59371
27	0.29012	1.30823	9.90618	0.63547	27	1.22816	0.94655	9.98967	0.59295
28	0.35419	1.30741	9.90800	0.63586	28	1.23159	0.93094	9.99057	0.59222
29	0.40989	1.30647	9.90981	0.63618	29	1.23488	0.91461	9.99146	0.59155
30	+0.45915	-1.30541	+9.91161	+0.63644	30	+1.23803	-0.89750	+9.99233	+0.59082
31	+0.50327	-1.30423	+9.91340	+0.63664	31	+1.24103	-0.87956	+9.99320	+0.59034

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR CORRECTING THE PLACES OF THE FIXED STARS.

Date.	A.	B.	C.	D.	Date.	A.	B.	C.	D.
Sept. 1	+1.24388	-0.86071	+9.99406	+0.58980	Nov. 1	+1.16169	+1.11236	+0.04251	+0.66854
2	1.24660	0.84085	9.99491	0.58932	2	1.15536	1.12148	0.04346	0.67099
3	1.24918	0.81990	9.99574	0.58889	3	1.14880	1.13028	0.04444	0.67344
4	1.25162	0.79775	9.99657	0.58852	4	1.14199	1.13879	0.04542	0.67589
5	1.25392	0.77425	9.99739	0.58820	5	1.13494	1.14700	0.04641	0.67834
6	+1.25609	-0.74928	+9.99819	+0.58794	6	+1.12763	+1.15493	+0.04742	+0.68079
7	1.25813	0.72262	9.99899	0.58774	7	1.12005	1.16259	0.04842	0.68322
8	1.26004	0.69407	9.99978	0.58761	8	1.11220	1.17000	0.04944	0.68563
9	1.26181	0.66335	0.00057	0.58754	9	1.10407	1.17715	0.05048	0.68801
10	1.26345	0.63015	0.00135	0.58753	10	1.09564	1.18405	0.05152	0.69038
11	+1.26496	-0.59403	+0.00213	+0.58757	11	+1.08691	+1.19072	+0.05257	+0.69273
12	1.26634	0.55447	0.00290	0.58768	12	1.07785	1.19716	0.05363	0.69506
13	1.26759	0.51080	0.00366	0.58786	13	1.06846	1.20338	0.05470	0.69737
14	1.26871	0.46205	0.00442	0.58810	14	1.05872	1.20938	0.05578	0.69965
15	1.26971	0.40697	0.00517	0.58842	15	1.04861	1.21516	0.05686	0.70191
16	+1.27057	-0.34370	+0.00592	+0.58881	16	+1.03812	+1.22074	+0.05796	+0.70414
17	1.27132	0.26942	0.00666	0.58927	17	1.02723	1.22612	0.05906	0.70634
18	1.27193	0.17954	0.00740	0.58980	18	1.01592	1.23129	0.06018	0.70851
19	1.27242	0.06586	0.00814	0.59040	19	1.00416	1.23628	0.06131	0.71064
20	1.27278	9.91118	0.00888	0.59106	20	0.99193	1.24108	0.06244	0.71273
21	+1.27301	-9.66832	+0.00963	+0.59179	21	+0.97921	+1.24569	+0.06357	+0.71478
22	1.27311	-9.06631	0.01036	0.59259	22	0.96596	1.25012	0.06471	0.71680
23	1.27309	+9.36759	0.01107	0.59345	23	0.95214	1.25438	0.06587	0.71879
24	1.27294	9.76557	0.01181	0.59438	24	0.93773	1.25846	0.06703	0.72074
25	1.27266	9.96971	0.01251	0.59539	25	0.92268	1.26237	0.06819	0.72265
26	+1.27226	+0.10799	+0.01324	+0.59648	26	+0.90694	+1.26611	+0.06936	+0.72452
27	1.27173	0.21266	0.01397	0.59763	27	0.89046	1.26969	0.07054	0.72635
28	1.27107	0.29688	0.01470	0.59885	28	0.87319	1.27311	0.07172	0.72813
29	1.27028	0.36732	0.01543	0.60012	29	0.85505	1.27636	0.07291	0.72985
30	1.26936	0.42785	0.01616	0.60146	30	0.83597	1.27945	0.07411	0.73153
31	+1.26831	-0.48086	+0.01690	+0.60285	31	+0.81586	+1.28239	+0.07531	+0.73317
Oct. 1	1.26831	0.48086	0.01690	0.60285	Dec. 1	0.81586	1.28239	0.07531	0.73317
2	1.26713	0.52804	0.01763	0.60432	2	0.79462	1.28518	0.07652	0.73475
3	1.26581	0.57048	0.01837	0.60584	3	0.77214	1.28782	0.07773	0.73628
4	1.26436	0.60904	0.01910	0.60744	4	0.74828	1.29030	0.07894	0.73777
5	+1.26278	+0.64438	+0.01986	+0.60909	5	+0.72288	+1.29264	+0.08016	+0.73922
6	1.26106	0.67696	0.02061	0.61079	6	0.69574	1.29483	0.08137	0.74061
7	1.25920	0.70716	0.02135	0.61255	7	0.66664	1.29686	0.08259	0.74195
8	1.25720	0.73529	0.02211	0.61436	8	0.63530	1.29876	0.08381	0.74323
9	1.25506	0.76160	0.02287	0.61622	9	0.60136	1.30051	0.08504	0.74446
10	+1.25278	+0.78630	+0.02365	+0.61813	10	+0.56437	+1.30212	+0.08626	+0.74564
11	1.25036	0.80956	0.02442	0.62009	11	0.52378	1.30359	0.08749	0.74676
12	1.24779	0.83153	0.02520	0.62210	12	0.47886	1.30492	0.08871	0.74782
13	1.24507	0.85233	0.02599	0.62415	13	0.42857	1.30610	0.08994	0.74883
14	1.24220	0.87206	0.02679	0.62624	14	0.37152	1.30715	0.09117	0.74979
15	+1.23918	+0.89082	+0.02759	+0.62837	15	+0.30567	+1.30805	+0.09240	+0.75069
16	1.23601	0.90869	0.02840	0.63054	16	0.22785	1.30882	0.09362	0.75154
17	1.23268	0.92573	0.02921	0.63275	17	0.13279	1.30945	0.09484	0.75234
18	1.22919	0.94201	0.03003	0.63499	18	0.01071	1.30994	0.09606	0.75308
19	1.22553	0.95758	0.03087	0.63726	19	9.84007	1.31029	0.09729	0.75377
20	+1.22172	+0.97250	+0.03171	+0.63950	20	+9.55474	+1.31051	+0.09851	+0.75441
21	1.21774	0.98680	0.03256	0.64189	21	+8.40352	1.31059	0.09972	0.75500
22	1.21358	1.00053	0.03342	0.64424	22	-9.48867	1.31053	0.10094	0.75553
23	1.20924	1.01371	0.03428	0.64662	23	9.80715	1.31034	0.10214	0.75600
24	1.20473	1.02638	0.03516	0.64901	24	9.98878	1.31000	0.10334	0.75642
25	+1.20004	+1.03857	+0.03604	+0.65141	25	-0.11642	+1.30953	+0.10453	+0.75678
26	1.19517	1.05031	0.03684	0.65382	26	0.21483	1.30892	0.10573	0.75708
27	1.19010	1.06161	0.03764	0.65625	27	0.29489	1.30818	0.10692	0.75734
28	1.18483	1.07251	0.03876	0.65870	28	0.36234	1.30729	0.10810	0.75754
29	1.17937	1.08302	0.03968	0.66116	29	0.42761	1.30626	0.10928	0.75769
30	+1.17369	+1.09315	+0.04062	+0.66361	30	-0.47189	+1.30510	+0.11045	+0.75779
31	+1.16780	+1.10293	+0.04156	+0.66608	31	-0.51757	+1.30379	+0.11161	+0.75784

FOR WASHINGTON MEAN MIDNIGHT.

CONSTANTS FOR FACILITATING THE REDUCTION OF THE FIXED STARS.

1863.	<i>f.</i>	Log. <i>g.</i>	<i>G.</i>	Log. <i>h.</i>	<i>H.</i>	Log. <i>i.</i>	<i>τ.</i>
Jan. 1	+15.84	0.8731	22° 37'	1.3092	349° 32'	-0.2057	0.000
6	16.64	0.8916	21 35	1.3078	344 49	0.3632	0.014
11	17.43	0.9086	20 34	1.3059	340 4	0.4759	0.027
16	18.19	0.9244	19 34	1.3035	335 16	0.5625	0.041
21	18.92	0.9390	18 36	1.3008	330 25	0.6317	0.055
26	+19.62	0.9525	17 41	1.2978	325 30	-0.6884	0.068
31	20.28	0.9648	16 49	1.2947	320 32	0.7353	0.082
Feb. 5	20.91	0.9762	16 1	1.2914	315 30	0.7745	0.096
10	21.49	0.9867	15 17	1.2881	310 23	0.8073	0.110
15	22.04	0.9964	14 38	1.2849	305 12	0.8346	0.123
20	+22.56	1.0054	14 4	1.2819	299 58	-0.8670	0.137
25	23.05	1.0138	13 35	1.2792	294 40	0.8751	0.151
Mar. 2	23.51	1.0217	13 13	1.2769	289 19	0.8892	0.164
7	23.95	1.0293	12 56	1.2751	283 56	0.8996	0.178
12	24.38	1.0366	12 45	1.2739	278 32	0.9065	0.192
17	+24.79	1.0437	12 39	1.2732	273 7	-0.9100	0.205
22	25.20	1.0508	12 39	1.2732	267 43	0.9103	0.219
27	25.61	1.0580	12 43	1.2737	262 20	0.9073	0.233
April 1	26.03	1.0652	12 52	1.2749	256 59	0.9010	0.246
6	26.46	1.0727	13 4	1.2765	251 41	0.8914	0.260
11	+26.91	1.0805	13 19	1.2787	246 26	-0.8783	0.274
16	27.38	1.0885	13 36	1.2812	241 16	0.8616	0.287
21	27.88	1.0969	13 54	1.2841	236 11	0.8410	0.301
26	28.41	1.1056	14 12	1.2871	231 10	0.8161	0.315
May 1	28.96	1.1146	14 30	1.2902	226 15	0.7864	0.329
6	+29.55	1.1239	14 46	1.2934	221 25	-0.7513	0.342
11	30.17	1.1335	15 1	1.2965	216 39	0.7098	0.356
16	30.83	1.1432	15 13	1.2994	211 58	0.6606	0.370
21	31.51	1.1531	15 23	1.3020	207 21	0.6017	0.383
26	32.22	1.1629	15 30	1.3044	202 48	0.5301	0.397
31	+32.95	1.1728	15 33	1.3066	198 18	-0.4408	0.411
June 5	33.70	1.1826	15 33	1.3083	193 51	0.3245	0.424
10	34.47	1.1923	15 30	1.3095	189 26	0.1611	0.438
15	35.25	1.2018	15 24	1.3103	185 2	9.8905	0.452
20	36.03	1.2110	15 15	1.3106	180 39	-9.0011	0.465
25	+36.81	1.2199	15 3	1.3104	176 16	+9.7609	0.479
30	37.59	1.2285	14 49	1.3098	171 53	0.0966	0.493
July 5	38.36	1.2368	14 33	1.3087	167 29	0.2817	0.507
10	39.12	1.2447	14 15	1.3071	163 4	0.4089	0.520
15	39.85	1.2521	13 56	1.3052	158 36	0.5048	0.534
20	+40.56	1.2592	13 36	1.3029	154 5	+0.5808	0.548
25	41.25	1.2659	13 16	1.3003	149 32	0.6429	0.561
30	41.90	1.2721	12 55	1.2975	144 54	0.6946	0.575
Aug. 4	42.53	1.2780	12 35	1.2945	140 12	0.7381	0.589
9	43.12	1.2835	12 16	1.2914	135 26	0.7750	0.602
14	+43.68	1.2886	11 58	1.2882	130 35	+0.8062	0.616
19	44.21	1.2933	11 41	1.2851	125 39	0.8325	0.630
24	44.71	1.2978	11 27	1.2822	120 39	0.8544	0.643
29	45.18	1.3021	11 14	1.2796	115 34	0.8723	0.657
Sept. 3	45.63	1.3061	11 3	1.2773	110 25	0.8866	0.671
8	+46.05	1.3100	10 55	1.2755	105 12	+0.8975	0.684
13	46.47	1.3137	10 50	1.2741	99 56	0.9050	0.698
18	46.87	1.3174	10 48	1.2733	94 37	0.9094	0.712
23	47.27	1.3211	10 47	1.2731	89 17	0.9105	0.726
28	47.66	1.3247	10 50	1.2735	83 57	0.9085	0.739
Oct. 3	+48.07	1.3285	10 55	1.2745	78 36	+0.9033	0.753
8	48.49	1.3325	11 2	1.2760	73 16	0.8946	0.767
13	+48.92	1.3366	11 11	1.2780	67 58	+0.8825	0.780

FOR WASHINGTON MEAN MIDNIGHT.

CONSTANTS FOR FACILITATING THE REDUCTION OF THE FIXED STARS.

1863.	<i>f</i> .	Log. <i>g</i> .	<i>G</i> .	Log. <i>h</i> .	<i>H</i> .	Log. <i>i</i> .	<i>τ</i> .
Oct. 18	+49.38	1.3409	11° 21'	1.2905	62° 42'	+0.8666	0.794
23	49.86	1.3454	11 33	1.2833	57 29	0.8467	0.808
28	50.38	1.3502	11 44	1.2864	52 20	0.8223	0.821
Nov. 2	50.93	1.3552	11 56	1.2897	47 14	0.7928	0.835
7	51.51	1.3605	12 8	1.2929	42 12	0.7575	0.849
12	+52.13	1.3660	12 19	1.2961	37 14	+0.7153	0.862
17	52.79	1.3717	12 29	1.2992	32 19	0.6647	0.876
22	53.48	1.3776	12 37	1.3020	27 28	0.6034	0.890
27	54.20	1.3836	12 43	1.3046	22 40	0.5279	0.903
Dec. 2	54.95	1.3897	12 47	1.3068	17 55	0.4321	0.917
7	+55.73	1.3958	12 49	1.3085	13 11	+0.3041	0.931
12	56.52	1.4019	12 49	1.3097	8 29	0.1159	0.945
17	57.32	1.4079	12 46	1.3104	3 49	+9.7702	0.958
22	58.13	1.4139	12 41	1.3106	359 8	-9.1261	0.972
27	58.94	1.4197	12 34	1.3102	354 28	9.9323	0.986
32	+59.74	1.4253	12 25	1.3093	349 46	-0.1963	0.999

BESSEL'S FORMULÆ OF REDUCTION FOR THE FIXED STARS,

WITH DR. PETERS'S COEFFICIENTS, AND THE NOTATION OF THE CATALOGUE OF STARS
OF THE BRITISH ASSOCIATION.

$$A = -20''.4451 \cos \omega \cos \odot.$$

$$B = -20''.4451 \sin \odot.$$

$$C = \tau - 0.34238 \sin \Omega + 0.00410 \sin 2\Omega - 0.02519 \sin 2\odot \\ + 0.00294 \sin (\odot + 82^\circ 34') - 0.00405 \sin 2\epsilon + 0.00135 \sin (\epsilon - \Gamma').$$

$$D = -9''.2236 \cos \Omega + 0''.0896 \cos 2\Omega - 0''.5507 \cos 2\odot - 0''.0092 \cos (\odot + 280^\circ 22') \\ - 0''.0885 \cos 2\epsilon.$$

$$E = -0''.0481 \sin \Omega + 0''.0014 \sin 2\Omega - 0''.0034 \sin 2\odot.$$

$$a = \cos \alpha \sec \delta.$$

$$b = \sin \alpha \sec \delta.$$

$$c = 46''.0780 + 20''.0560 \sin \alpha \tan \delta.$$

$$d = \cos \alpha \tan \delta.$$

$$a' = \tan \omega \cos \delta - \sin \alpha \sin \delta.$$

$$b' = \cos \alpha \sin \delta.$$

$$c' = 20''.0560 \cos \alpha.$$

$$d' = -\sin \alpha.$$

μ = the annual proper motion in right ascension.

μ' = the annual proper motion in declination.

τ = the time from the beginning of the year in fractional parts of the year.

\odot = the sun's longitude.

ϵ = the moon's longitude.

Ω = the longitude of the moon's ascending node.

ω = the obliquity of the ecliptic.

α = the star's mean right ascension for the beginning of the year.

δ = the star's mean declination for the beginning of the year.

α' = the star's apparent right ascension at the time τ .

δ' = the star's apparent declination at the time τ .

$$\alpha' - \alpha = A a + B b + C c + D d + E + \tau \mu.$$

$$\delta' - \delta = A a' + B b' + C c' + D d' + \tau \mu'.$$

The following formulæ may also be used by putting

$$g \cos G = 46''.0780 C.$$

$$g \sin G = D.$$

$$i = A \tan \alpha.$$

$$h \cos H = B.$$

$$h \sin H = A.$$

$$\alpha' - \alpha = f + \tau \mu + g \sin (G + \alpha) \tan \delta + h \sin (H + \alpha) \sec \delta.$$

$$\delta' - \delta = i \cos \delta + \tau \mu' + g \cos (G + \alpha) + h \cos (H + \alpha) \sin \delta.$$

MEAN PLACES OF 100 PRINCIPAL FIXED STARS, FOR
JANUARY 1, 1863.

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
α ANDROMEDÆ . . .	2	^h 0 ^m 1 18.67	+ 3.085	+28° 20' 2.5	+19.91
γ PEGASI (<i>Algenib</i>) . .	3.2	0 6 11.01	3.080	+14 25 18.0	20.03
β Hydræ	3	0 18 29.92	3.284	—78 1 36.2	20.24
α CASSIOPEÆ . . .	var.	0 32 45.16	3.359	+55 47 7.8	19.83
β Ceti	2	0 36 42.60	3.016	—18 44 21.5	19.82
α URS. MIN. (<i>Polaris</i>)	2	1 8 59.29	+19.195	+88 34 44.9	+19.15
δ^1 Ceti	3	1 17 10.60	3.000	— 8 53 28.8	18.74
α Eridani (<i>Achernar</i>) .	1	1 32 36.38	2.238	—57 56 0.5	18.45
α ARIETIS	2	1 59 27.38	3.365	+22 48 46.4	17.25
γ Ceti	3.4	2 36 12.24	3.102	+ 2 39 22.9	15.38
α CETI	2.3	2 55 7.19	+ 3.127	+ 3 32 59.1	+14.37
α PERSEI	2	3 14 33.46	4.245	+49 22 12.9	13.22
η Tauri	3	3 39 20.71	3.554	+23 40 43.3	11.52
γ^1 Eridani	3	3 51 38.26	2.796	—13 54 2.6	10.56
α TAURI (<i>Aldebaran</i>) .	1	4 28 3.76	3.435	+16 13 50.9	7.66
α AURIGÆ (<i>Capella</i>) .	1	5 6 34.44	+ 4.423	+45 51 16.0	+ 4.21
β ORIONIS (<i>Rigel</i>) . .	1	5 7 57.27	2.880	— 8 21 46.8	4.49
β TAURI	2	5 17 38.00	3.787	+28 29 15.9	3.49
δ ORIONIS	2	5 25 0.55	3.066	— 0 24 13.3	3.03
α Leporis	3	5 26 41.36	2.648	—17 55 22.6	2.92
ϵ ORIONIS	2	5 29 15.76	+ 3.044	— 1 17 32.7	+ 2.69
α COLUMBÆ	2	5 34 41.46	2.177	—34 8 55.6	2.21
α ORIONIS	var.	5 47 45.31	3.247	+ 7 22 41.2	+ 1.07
μ Geminorum	3	6 14 40.36	3.636	+22 34 48.8	— 1.41
α Argus (<i>Canopus</i>) .	1	6 20 54.77	1.330	—52 37 19.1	1.82
51 (Hev.) Cephei . . .	5	6 35 9.88	+30.418	+87 14 44.6	— 3.14
α CANIS MAJ. (<i>Sirius</i>)	1	6 39 6.80	2.646	—16 31 49.7	4.61
ϵ Canis Majoris . . .	2.1	6 53 14.54	2.360	—28 47 17.5	4.62
δ Geminorum	3.4	7 11 56.40	3.597	+22 13 52.5	6.19
α^2 GEMINOR. (<i>Castor</i>) .	2.1	7 25 50.98	3.840	+32 11 6.1	7.43
α CAN. MIN. (<i>Procyon</i>)	1	7 32 7.72	+ 3.146	+ 5 34 24.9	— 8.88
β GEMINOR. (<i>Pollux</i>) .	1.2	7 36 55.69	3.682	+28 21 13.4	8.30
15 Argus	3	8 1 42.62	2.558	—23 54 41.2	10.08
ϵ Hydræ	3.4	8 39 31.20	3.189	+ 6 55 9.4	12.88
ι Ursæ Majoris . . .	3	8 49 48.63	4.142	+48 34 36.4	13.80
ι Argus	2	9 13 25.32	+ 1.602	—58 42 2.5	—14.90
α HYDRÆ	2	9 20 51.24	2.948	— 8 4 0.3	15.39
θ Ursæ Majoris . . .	3	9 23 40.41	4.056	+52 17 57.3	16.13
ϵ Leonis	3	9 38 4.20	3.423	+24 24 12.0	16.36
α LEONIS (<i>Regulus</i>) .	1.2	10 1 4.35	3.203	+12 38 7.1	17.41
η Argus	2	10 39 45.19	+ 2.306	—58 57 51.4	—18.73
α URSÆ MAJORIS . . .	2	10 55 14.77	3.773	+62 29 22.7	19.34
δ LEONIS	2.3	11 6 49.13	3.207	+21 16 25.6	19.65
δ Hydræ et Crateris .	3.4	11 12 29.57	+ 2.997	—14 2 15.8	—19.45

MEAN PLACES OF 100 PRINCIPAL FIXED STARS, FOR
JANUARY 1, 1863.

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
		^h ^m ^s	^s	[°] ['] ["]	^s
β LEONIS	2	11 42 4.14	+ 3.065	+15 20 16.0	-20.10
γ URSÆ MAJORIS	2.3	11 46 36.56	3.193	+54 27 22.8	20.04
β Chamæleontis	5	12 10 22.60	3.326	-78 33 5.7	20.05
α^1 Crucis	1	12 18 59.87	3.260	-62 20 19.7	19.94
β Corvi	2.3	12 27 11.61	3.133	-22 38 19.5	19.99
12 Canum Venaticorum . .	3	12 49 36.80	+ 2.822	+39 3 32.1	-19.56
α VIRGINIS (<i>Spica</i>) . . .	1	13 17 58.71	3.150	-10 26 43.7	18.96
η URSÆ MAJORIS	2	13 42 8.29	2.371	+49 59 52.8	18.14
η Bootis	3	13 48 9.72	2.862	+19 5 9.0	18.22
β Centauri	1	13 54 11.14	4.155	-59 42 36.1	17.71
α BOOTIS (<i>Arcturus</i>) . . .	1	14 9 24.77	+ 2.733	+19 53 49.8	-18.92
α^2 Centauri	1	14 30 20.07	4.030	-60 15 54.0	15.07
ϵ BOOTIS	2.3	14 39 0.19	2.622	+27 39 12.2	15.43
α^3 LIBRÆ	3	14 43 18.22	+ 3.305	-15 28 13.3	15.24
β URSÆ MINORIS	2	14 51 8.41	- 0.257	+74 42 54.3	14.78
β Libræ	2	15 9 38.27	+ 3.220	- 8 52 29.9	-13.58
α CORONÆ BOREALIS . . .	2	15 28 53.27	2.538	+27 10 40.1	12.36
α SERPENTIS	2.3	15 37 31.25	+ 2.949	+ 6 51 31.8	11.64
ζ URSÆ MINORIS	4.5	15 49 1.50	- 2.303	+78 12 51.4	10.84
β^1 Scorpii	2	15 57 28.50	+ 3.479	-19 25 39.0	10.26
δ OPHIUCHI	3	16 7 10.07	+ 3.138	- 3 20 19.5	- 9.61
α SCORPII (<i>Antares</i>) . . .	1.2	16 21 0.69	3.666	-26 7 29.7	8.44
η Draconis	3.2	16 22 9.01	0.822	+61 49 30.5	8.22
α Trianguli Australis . . .	2	16 34 11.61	+ 6.275	-68 46 12.5	7.43
ϵ URSÆ MINORIS	4.5	17 0 7.77	- 6.417	+82 15 25.6	5.17
α HERCULIS	var.	17 8 24.06	+ 2.733	+14 32 56.3	- 4.44
β DRACONIS	3.2	17 27 20.29	1.353	+52 24 14.7	2.84
α OPHIUCHI	2	17 28 34.53	2.781	+12 39 44.9	2.95
σ Octantis	6	17 53 37.30	110.187	-89 16 42.7	0.46
γ DRACONIS	2.3	17 53 25.55	1.394	+51 30 22.3	- 0.60
μ^1 Sagittarii	4	18 5 34.12	+ 3.587	-21 5 28.4	+ 0.49
δ URSÆ MINORIS	4.5	18 16 32.36	-19.364	+86 36 11.4	1.46
α LYRÆ (<i>Vega</i>)	1	18 32 18.00	+ 2.031	+38 39 28.5	3.09
β LYRÆ	var.	18 45 1.27	2.215	+33 12 20.0	3.89
ζ AQUILÆ	3	18 59 6.69	2.755	+13 39 45.4	5.05
δ AQUILÆ	3.4	19 18 35.37	+ 3.027	+ 2 50 40.0	+ 6.84
γ AQUILÆ	3	19 39 44.74	2.852	+10 16 54.5	8.46
α AQUILÆ (<i>Altair</i>)	1.2	19 44 5.90	2.928	+ 8 30 32.0	9.17
β AQUILÆ	4	19 48 34.96	+ 2.946	+ 6 4 0.5	8.67
λ URSÆ MINORIS	5	20 1 4.01	-57.203	+88 53 55.2	10.08
α^2 CAPRICORNI	3.4	20 10 27.01	+ 3.334	-12 58 2.0	+10.80
α Pavonis	2	20 14 47.60	4.800	-57 10 11.4	11.08
α CYGNI	2.1	20 36 45.70	2.043	+44 47 31.7	12.67
β^1 CYGNI	5.6	21 0 45.26	+ 2.676	+38 4 39.1	+17.47

MEAN PLACES OF 100 PRINCIPAL FIXED STARS, FOR
JANUARY 1, 1863.

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
ζ Cygni	3	^h 21 ^m 7 ^s 6.33	+ 2.550	+29° 39' 59.7"	+14.55
α CEPHEI.	3.2	21 15 18.40	1.439	+62 0 20.7	15.11
β AQUARI	3	21 24 20.60	3.163	— 6 10 18.9	15.63
β CEPHEI.	3	21 26 52.78	0.802	+69 57 34.3	15.69
ϵ Pegasi	2.3	21 37 27.44	2.951	+ 9 14 54.7	16.32
α AQUARI	3	21 58 44.73	+ 3.083	— 0 59 3.3	+17.30
α Gruis	2	21 59 34.96	3.820	—47 37 20.3	17.16
ζ Pegasi	3.4	22 34 37.63	2.990	+10 7 2.4	18.69
α PIS. AUS. (<i>Fomalhaut</i>)	1.2	22 50 4.37	3.331	—30 20 53.6	18.94
α PEGASI (<i>Markab</i>) .	2	22 57 56.29	2.983	+14 28 8.2	19.31
ι Piscium	4.5	23 32 54.29	+ 3.084	+ 4 53 2.8	+19.47
γ Cephei	3.4	23 33 45.08	+ 2.397	+76 52 4.4	+20.06

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*), FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h ^m 1 8	88° 35'	^h ^m 1 8	88° 35'	^h ^m 1 8	88° 34'	^h ^m 1 8	88° 34'	
1	79.95	10.70	54.17	10.58	35.28	65.42	26.07	56.32	1
2	79.23	10.80	53.32	10.50	34.68	65.18	25.99	55.98	2
3	78.45	10.91	52.45	10.40	34.07	64.92	25.95	55.62	3
4	77.62	11.03	51.57	10.27	33.48	64.65	25.99	55.27	4
5	76.75	11.13	50.70	10.12	32.91	64.36	26.08	54.93	5
6	75.85	11.23	49.85	9.96	32.40	64.06	26.22	54.61	6
7	74.91	11.30	49.05	9.79	31.96	63.75	26.39	54.30	7
8	73.96	11.35	48.31	9.60	31.58	63.44	26.56	54.01	8
9	73.02	11.37	47.62	9.43	31.25	63.14	26.71	53.74	9
10	72.11	11.38	46.99	9.26	30.96	62.87	26.81	53.47	10
11	71.24	11.37	46.37	9.09	30.69	62.61	26.88	53.19	11
12	70.42	11.37	45.76	8.94	30.41	62.35	26.93	52.89	12
13	69.63	11.35	45.13	8.80	30.10	62.10	26.98	52.58	13
14	68.88	11.35	44.46	8.66	29.75	61.85	27.04	52.24	14
15	68.16	11.37	43.72	8.52	29.36	61.58	27.15	51.90	15
16	67.42	11.40	42.94	8.35	28.94	61.29	27.32	51.55	16
17	66.63	11.43	42.16	8.15	28.53	60.98	27.55	51.22	17
18	65.78	11.46	41.39	7.93	28.16	60.65	27.85	50.90	18
19	64.85	11.47	40.66	7.70	27.84	60.31	28.20	50.59	19
20	63.89	11.45	39.99	7.45	27.60	59.97	28.58	50.30	20
21	62.93	11.41	39.38	7.20	27.42	59.64	28.96	50.02	21
22	61.99	11.35	38.82	6.95	27.29	59.31	29.33	49.75	22
23	61.09	11.26	38.31	6.71	27.20	59.00	29.67	49.50	23
24	60.25	11.17	37.83	6.49	27.13	58.70	29.98	49.24	24
25	59.46	11.08	37.36	6.28	27.05	58.42	30.27	48.98	25
26	58.70	10.99	36.88	6.07	26.97	58.14	30.55	48.70	26
27	57.98	10.91	36.38	5.85	26.86	57.85	30.82	48.42	27
28	57.25	10.83	35.84	5.63	26.72	57.57	31.09	48.12	28
29	56.53	10.77	35.28	5.42	26.55	57.29	31.40	47.81	29
30	55.78	10.71	34.68	5.18	26.38	56.99	31.77	47.51	30
31	54.99	10.65	34.07	4.92	26.21	56.67	32.20	47.20	31
32	54.17	10.58	33.48	4.65	26.07	56.32	32.70	46.89	32

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*), FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	MAY.		JUNE.		JULY.		AUGUST.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h ^m 1 8	88° 34'	^h ^m 1 8	88° 34'	^h ^m 1 9	88° 34'	^h ^m 1 9	88° 34'	
1	32.20	47.20	51.89	40.73	17.79	39.16	44.73	42.56	1
2	32.70	46.89	52.78	40.63	18.65	39.22	45.46	42.72	2
3	33.26	46.62	53.62	40.54	19.44	39.26	46.22	42.88	3
4	33.85	46.36	54.39	40.45	20.22	39.29	47.04	43.05	4
5	34.45	46.13	55.12	40.36	21.01	39.30	47.91	43.23	5
6	35.03	45.92	55.81	40.25	21.84	39.32	48.81	43.42	6
7	35.56	45.71	56.50	40.13	22.72	39.34	49.72	43.64	7
8	36.04	45.50	57.22	39.99	23.65	39.37	50.60	43.88	8
9	36.49	45.28	58.00	39.86	24.62	39.42	51.45	44.13	9
10	36.92	45.04	58.82	39.73	25.63	39.49	52.27	44.40	10
11	37.37	44.79	59.71	39.62	26.63	39.58	53.05	44.66	11
12	37.85	44.52	60.64	39.52	27.61	39.68	53.77	44.92	12
13	38.39	44.25	61.60	39.44	28.58	39.80	54.44	45.18	13
14	39.01	44.00	62.55	39.38	29.52	39.93	55.09	45.44	14
15	39.67	43.75	63.49	39.34	30.40	40.07	55.72	45.66	15
16	40.39	43.53	64.42	39.32	31.24	40.20	56.35	45.88	16
17	41.12	43.32	65.31	39.30	32.04	40.32	57.00	46.11	17
18	41.85	43.14	66.15	39.28	32.82	40.44	57.68	46.33	18
19	42.59	42.96	66.97	39.26	33.61	40.53	58.40	46.56	19
20	43.31	42.79	67.77	39.23	34.40	40.63	59.17	46.81	20
21	43.99	42.63	68.56	39.19	35.22	40.72	59.97	47.08	21
22	44.64	42.46	69.36	39.15	36.08	40.83	60.76	47.37	22
23	45.26	42.30	70.16	39.11	36.98	40.94	61.54	47.67	23
24	45.87	42.12	71.00	39.06	37.93	41.07	62.29	48.00	24
25	46.49	41.93	71.91	39.01	38.92	41.22	62.96	48.32	25
26	47.13	41.74	72.87	38.98	39.90	41.40	63.55	48.64	26
27	47.79	41.55	73.86	38.97	40.84	41.61	64.09	48.94	27
28	48.50	41.36	74.87	38.99	41.74	41.82	64.58	49.23	28
29	49.28	41.17	75.89	39.03	42.56	42.02	65.07	49.49	29
30	50.12	41.00	76.87	39.09	43.33	42.21	65.60	49.76	30
31	50.99	40.85	77.79	39.16	44.03	42.40	66.19	50.03	31
32	51.89	40.73	78.65	39.22	44.73	42.56	66.81	50.31	32

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*), FOR THE UPPER TRANSIT AT WASHINGTON.

Sideral Day of the Month.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		Sideral Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 1 ^m 10	88° 34'	^h 1 ^m 10	88° 35'	^h 1 ^m 10	88° 35'	^h 1 ^m 9	88° 35'	
1	6.81	50.31	19.59	0.72	20.71	12.46	69.10	22.22	1
2	7.47	50.60	19.93	1.13	20.51	12.84	68.44	22.49	2
3	8.15	50.92	20.21	1.54	20.23	13.22	67.76	22.73	3
4	8.81	51.26	20.44	1.94	19.92	13.59	67.06	22.96	4
5	9.45	51.60	20.62	2.35	19.58	13.93	66.40	23.17	5
6	10.05	51.96	20.75	2.75	19.22	14.25	65.76	23.40	6
7	10.61	52.32	20.84	3.14	18.88	14.56	65.17	23.62	7
8	11.09	52.68	20.89	3.51	18.58	14.88	64.64	23.85	8
9	11.52	53.04	20.92	3.87	18.31	15.20	64.13	24.10	9
10	11.92	53.38	20.95	4.22	18.09	15.53	63.60	24.36	10
11	12.29	53.71	21.01	4.56	17.90	15.87	63.04	24.63	11
12	12.66	54.02	21.10	4.91	17.69	16.23	62.39	24.89	12
13	13.05	54.34	21.22	5.26	17.46	16.60	61.66	25.13	13
14	13.47	54.65	21.37	5.62	17.18	16.97	60.87	25.35	14
15	13.91	54.96	21.55	6.00	16.85	17.34	60.03	25.54	15
16	14.39	55.29	21.72	6.41	16.44	17.70	59.17	25.72	16
17	14.91	55.63	21.85	6.82	15.95	18.03	58.33	25.88	17
18	15.43	55.99	21.91	7.24	15.40	18.34	57.54	26.02	18
19	15.93	56.38	21.91	7.65	14.83	18.64	56.82	26.17	19
20	16.40	56.77	21.83	8.05	14.30	18.92	56.13	26.32	20
21	16.80	57.17	21.68	8.42	13.83	19.20	55.46	26.50	21
22	17.13	57.56	21.52	8.78	13.42	19.47	54.82	26.68	22
23	17.39	57.93	21.36	9.13	13.03	19.75	54.17	26.86	23
24	17.60	58.29	21.22	9.47	12.66	20.06	53.48	27.05	24
25	17.79	58.63	21.13	9.80	12.28	20.37	52.74	27.23	25
26	18.00	58.97	21.08	10.15	11.89	20.70	51.95	27.40	26
27	18.24	59.29	21.06	10.51	11.45	21.03	51.11	27.56	27
28	18.53	59.62	21.06	10.88	10.94	21.34	50.23	27.70	28
29	18.86	59.97	21.03	11.27	10.37	21.66	49.31	27.83	29
30	19.22	60.34	21.00	11.67	9.76	21.95	48.40	27.93	30
31	19.59	60.72	20.89	12.07	9.10	22.22	47.47	28.00	31
32	19.93	61.13	20.71	12.46	8.44	22.49	46.56	28.07	32

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 18 ^m 16	86° 36'	^h 18 ^m 16	86° 35'	^h 18 ^m 16	86° 35'	^h 18 ^m 16	86° 35'	
1	3.19	12.31	6.18	62.67	13.91	56.88	24.94	55.67	1
2	3.16	11.99	6.37	62.38	14.23	56.71	25.34	55.73	2
3	3.13	11.67	6.58	62.07	14.57	56.55	25.73	55.82	3
4	3.10	11.34	6.81	61.77	14.92	56.41	26.11	55.92	4
5	3.08	10.99	7.05	61.48	15.28	56.28	26.47	56.04	5
6	3.08	10.63	7.31	61.21	15.66	56.16	26.81	56.18	6
7	3.10	10.26	7.58	60.96	16.04	56.07	27.14	56.31	7
8	3.15	9.89	7.85	60.73	16.41	56.02	27.45	56.44	8
9	3.22	9.53	8.13	60.52	16.78	55.97	27.75	56.56	9
10	3.31	9.19	8.39	60.32	17.12	55.93	28.06	56.65	10
11	3.40	8.87	8.64	60.15	17.45	55.89	28.38	56.73	11
12	3.50	8.57	8.87	59.95	17.78	55.85	28.70	56.81	12
13	3.59	8.28	9.10	59.74	18.11	55.79	29.04	56.90	13
14	3.68	8.01	9.34	59.51	18.43	55.70	29.39	57.01	14
15	3.75	7.73	9.58	59.27	18.76	55.61	29.76	57.14	15
16	3.81	7.43	9.84	59.02	19.12	55.53	30.12	57.30	16
17	3.88	7.12	10.14	58.77	19.50	55.46	30.47	57.47	17
18	3.95	6.79	10.45	58.54	19.89	55.41	30.81	57.67	18
19	4.04	6.44	10.79	58.34	20.29	55.39	31.12	57.87	19
20	4.16	6.09	11.12	58.15	20.68	55.39	31.41	58.07	20
21	4.31	5.74	11.45	57.99	21.08	55.41	31.69	58.28	21
22	4.48	5.40	11.78	57.85	21.45	55.43	31.96	58.47	22
23	4.65	5.10	12.10	57.73	21.80	55.47	32.23	58.66	23
24	4.84	4.81	12.40	57.61	22.15	55.52	32.49	58.83	24
25	5.02	4.54	12.70	57.47	22.49	55.55	32.76	58.99	25
26	5.20	4.28	12.99	57.34	22.83	55.59	33.04	59.15	26
27	5.37	4.03	13.29	57.19	23.15	55.60	33.32	59.31	27
28	5.53	3.78	13.59	57.04	23.48	55.61	33.62	59.49	28
29	5.69	3.52	13.91	56.88	23.83	55.61	33.92	59.68	29
30	5.85	3.25	14.23	56.71	24.18	55.63	34.23	59.90	30
31	6.01	2.97	14.57	56.55	24.56	55.64	34.53	60.15	31
32	6.18	2.67	14.92	56.41	24.94	55.67	34.81	60.42	32

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	MAY.		JUNE.		JULY.		AUGUST.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 18	^m 16	^h 18	^m 16	^h 18	^m 16	^h 18	^m 16	
1	34.53	0.15	40.05	8.95	39.65	18.78	33.65	27.78	1
2	34.81	0.42	40.09	9.29	39.52	19.06	33.41	28.03	2
3	35.08	0.69	40.13	9.60	39.40	19.33	33.15	28.29	3
4	35.31	0.97	40.17	9.90	39.30	19.61	32.89	28.56	4
5	35.51	1.24	40.21	10.18	39.20	19.91	32.63	28.84	5
6	35.71	1.49	40.28	10.46	39.11	20.22	32.33	29.12	6
7	35.91	1.73	40.35	10.75	39.00	20.55	32.01	29.39	7
8	36.11	1.94	40.42	11.05	38.89	20.90	31.68	29.66	8
9	36.33	2.16	40.50	11.37	38.76	21.25	31.34	29.91	9
10	36.56	2.38	40.56	11.72	38.60	21.60	31.00	30.13	10
11	36.80	2.61	40.60	12.08	38.42	21.94	30.65	30.33	11
12	37.05	2.86	40.63	12.45	38.22	22.26	30.31	30.52	12
13	37.28	3.13	40.63	12.81	38.02	22.58	29.98	30.70	13
14	37.50	3.43	40.62	13.17	37.81	22.88	29.66	30.88	14
15	37.71	3.74	40.59	13.52	37.60	23.16	29.34	31.06	15
16	37.91	4.06	40.55	13.86	37.39	23.43	29.02	31.25	16
17	38.09	4.37	40.51	14.19	37.18	23.69	28.72	31.44	17
18	38.24	4.69	40.47	14.50	36.99	23.96	28.40	31.65	18
19	38.37	5.00	40.43	14.79	36.81	24.22	28.07	31.87	19
20	38.50	5.29	40.40	15.07	36.63	24.49	27.74	32.10	20
21	38.63	5.56	40.38	15.37	36.45	24.78	27.38	32.33	21
22	38.76	5.83	40.35	15.68	36.26	25.09	27.00	32.54	22
23	38.89	6.10	40.33	16.00	36.05	25.40	26.60	32.75	23
24	39.03	6.36	40.30	16.33	35.82	25.72	26.19	32.92	24
25	39.17	6.63	40.27	16.69	35.57	26.04	25.79	33.06	25
26	39.33	6.91	40.22	17.04	35.29	26.35	25.39	33.18	26
27	39.49	7.21	40.15	17.42	35.01	26.63	25.00	33.30	27
28	39.64	7.53	40.05	17.79	34.72	26.89	24.65	33.42	28
29	39.77	7.87	39.93	18.14	34.43	27.13	24.31	33.54	29
30	39.89	8.23	39.79	18.47	34.15	27.35	23.97	33.69	30
31	39.98	8.59	39.65	18.78	33.89	27.56	23.61	33.86	31
32	40.05	8.95	39.52	19.06	33.65	27.78	23.24	34.03	32

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 18 ^m 16	[°] 86 ['] 36	^h 18 ^m 15	[°] 86 ['] 36	^h 18 ^m 15	[°] 86 ['] 36	^h 18 ^m 15	[°] 86 ['] 36	
1	23.24	34.03	70.79	36.11	58.05	33.49	48.78	26.64	1
2	22.87	34.20	70.34	36.13	57.66	33.30	48.57	26.32	2
3	22.47	34.37	69.88	36.12	57.28	33.09	48.36	26.01	3
4	22.05	34.52	69.42	36.09	56.93	32.89	48.19	25.71	4
5	21.62	34.66	68.97	36.04	56.59	32.67	48.01	25.42	5
6	21.19	34.78	68.53	35.98	56.26	32.47	47.84	25.15	6
7	20.76	34.88	68.10	35.90	55.94	32.28	47.67	24.89	7
8	20.34	34.96	67.69	35.82	55.62	32.11	47.47	24.63	8
9	19.91	35.03	67.30	35.75	55.31	31.95	47.27	24.36	9
10	19.50	35.09	66.91	35.69	54.98	31.79	47.07	24.07	10
11	19.11	35.14	66.53	35.63	54.64	31.62	46.86	23.77	11
12	18.73	35.21	66.14	35.60	54.29	31.44	46.66	23.45	12
13	18.34	35.28	65.74	35.57	53.91	31.25	46.48	23.10	13
14	17.95	35.37	65.33	35.55	53.55	31.02	46.32	22.74	14
15	17.57	35.46	64.90	35.51	53.20	30.78	46.20	22.37	15
16	17.17	35.58	64.46	35.46	52.87	30.51	46.09	22.03	16
17	16.75	35.68	64.01	35.38	52.57	30.24	46.00	21.70	17
18	16.31	35.78	63.56	35.28	52.28	29.97	45.91	21.40	18
19	15.86	35.85	63.13	35.15	52.02	29.70	45.81	21.11	19
20	15.40	35.91	62.71	35.01	51.76	29.46	45.72	20.82	20
21	14.95	35.93	62.31	34.86	51.51	29.23	45.61	20.53	21
22	14.49	35.94	61.93	34.72	51.24	29.02	45.50	20.23	22
23	14.05	35.94	61.57	34.58	50.96	28.81	45.39	19.92	23
24	13.65	35.92	61.20	34.46	50.68	28.59	45.28	19.60	24
25	13.25	35.92	60.84	34.36	50.39	28.36	45.17	19.27	25
26	12.86	35.94	60.47	34.27	50.10	28.11	45.08	18.92	26
27	12.48	35.96	60.09	34.17	49.82	27.85	45.01	18.55	27
28	12.07	36.00	59.68	34.07	49.54	27.56	44.94	18.18	28
29	11.66	36.04	59.28	33.95	49.27	27.26	44.91	17.81	29
30	11.23	36.08	58.87	33.81	49.01	26.95	44.90	17.46	30
31	10.79	36.11	58.46	33.67	48.78	26.64	44.90	17.11	31
32	10.34	36.13	58.05	33.49	48.57	26.32	44.92	16.77	32

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sideral Day of the Month.	α ANDROMEDÆ.		γ PEGASI. (Algenb.)		β HYDRÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h 0	^m 1	^h 0	^m 6	^h 0	^m 18
		28° 20'		14° 25'		78° 0'
Jan. 1	19.56 0.13	17.5 1.0	11.90 0.12	28.3 0.9	29.27 0.94	109.7 1.1
11	19.43 0.13	16.5 1.2	11.78 0.11	27.4 1.0	28.33 0.87	108.6 1.7
21	19.30 0.12	15.3 1.5	11.67 0.09	26.4 1.0	27.46 0.79	106.9 2.3
31	19.18 0.10	13.8 1.6	11.58 0.07	25.4 1.1	26.67 0.67	104.6 2.7
Feb. 10	19.08 0.07	12.2 1.7	11.51 0.06	24.3 1.0	26.00 0.54	101.9 3.0
20	19.01 0.04	10.5 1.6	11.45 0.04	23.3 1.0	25.46 0.42	98.9 3.4
March 2	18.97 0.00	8.9 1.5	11.41 0.00	22.3 0.8	25.04 0.27	95.5 3.6
12	18.97 0.05	7.4 1.4	11.41 0.04	21.5 0.6	24.77 0.09	91.9 3.8
22	19.02 0.08	6.0 1.2	11.45 0.07	20.9 0.3	24.68 0.07	88.1 3.9
April 1	19.10 0.14	4.8 0.9	11.52 0.12	20.6 0.1	24.75 0.22	84.2 3.8
11	19.24 0.18	3.9 0.5	11.64 0.16	20.5 0.3	24.97 0.36	80.4 3.7
21	19.42 0.21	3.4 0.1	11.80 0.19	20.8 0.5	25.33 0.51	76.7 3.4
May 1	19.63 0.26	3.3 0.3	11.99 0.24	21.3 0.8	25.84 0.66	73.3 3.2
11	19.89 0.30	3.6 0.5	12.23 0.27	22.1 1.2	26.50 0.79	70.1 2.9
21	20.19 0.32	4.1 1.0	12.50 0.29	23.3 1.4	27.29 0.91	67.2 2.5
31	20.51 0.33	5.1 1.4	12.79 0.30	24.7 1.7	28.20 0.99	64.7 2.1
June 10	20.84 0.34	6.5 1.7	13.09 0.32	26.4 1.9	29.19 1.05	62.6 1.6
20	21.18 0.34	8.2 1.9	13.41 0.33	28.3 1.9	30.24 1.09	61.0 1.0
30	21.52 0.33	10.1 2.2	13.74 0.32	30.2 2.1	31.33 1.10	60.0 0.4
July 10	21.85 0.32	12.3 2.4	14.06 0.29	32.3 2.1	32.43 1.07	59.6 0.2
20	22.17 0.29	14.7 2.4	14.35 0.27	34.4 2.2	33.50 1.01	59.8 0.7
30	22.46 0.25	17.1 2.5	14.62 0.25	36.6 2.0	34.51 0.93	60.5 1.2
Aug. 9	22.71 0.22	19.6 2.4	14.87 0.21	38.6 2.0	35.44 0.81	61.7 1.7
19	22.93 0.19	22.0 2.4	15.08 0.18	40.6 1.8	36.25 0.67	63.4 2.2
29	23.12 0.14	24.4 2.3	15.26 0.14	42.4 1.6	36.92 0.51	65.6 2.6
Sept. 8	23.26 0.10	26.7 2.3	15.40 0.10	44.0 1.5	37.43 0.32	68.2 2.9
18	23.36 0.06	29.0 2.1	15.50 0.06	45.5 1.3	37.75 0.14	71.1 3.0
28	23.42 0.02	31.1 1.8	15.56 0.03	46.8 1.0	37.89 0.05	74.1 3.1
Oct. 8	23.44 0.02	32.9 1.5	15.59 0.00	47.8 0.8	37.84 0.24	77.2 3.0
18	23.42 0.04	34.4 1.3	15.59 0.04	48.6 0.5	37.60 0.44	80.2 3.0
28	23.38 0.07	35.7 0.9	15.55 0.06	49.1 0.3	37.16 0.60	83.2 2.5
Nov. 7	23.31 0.10	36.6 0.7	15.49 0.08	49.4 0.1	36.56 0.73	85.7 2.1
17	23.21 0.11	37.3 0.4	15.41 0.09	49.5 0.2	35.83 0.84	87.8 1.8
27	23.10 0.13	37.7 0.1	15.32 0.11	49.3 0.4	34.99 0.93	89.6 1.2
Dec. 7	22.97 0.14	37.8 0.2	15.21 0.12	48.9 0.5	34.06 0.97	90.8 0.4
17	22.83 0.14	37.6 0.6	15.09 0.12	48.4 0.6	33.09 0.97	91.2 0.1
27	22.69 0.14	37.0 0.9	14.97 0.13	47.8 0.8	32.12 0.96	91.1 0.8
37	22.55	36.1	14.84	47.0	31.16	90.3

after the 23d of March it begins at the Sideral Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α CASSIOPEÆ.		β Ceti.		δ^1 Ceti.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 0 32	^m 55 47	^h 0 36	^m 18 43	^h 1 17	^m 8 53
Jan. 1	46.50 0.28	30.2 0.6	43.53 0.13	83.2 0.4	11.82 0.12	27.9 0.8
11	46.22 0.27	29.6 1.1	43.40 0.13	83.6 0.2	11.70 0.13	28.7 0.6
21	45.95 0.26	28.5 1.4	43.27 0.11	83.8 0.0	11.57 0.13	29.3 0.3
31	45.69 0.23	27.1 1.9	43.16 0.10	83.8 0.3	11.44 0.13	29.6 0.1
Feb. 10	45.46 0.20	25.2 2.2	43.06 0.10	83.5 0.6	11.31 0.11	29.7 0.0
20	45.26 0.15	23.0 2.4	42.96 0.06	82.9 0.9	11.20 0.09	29.7 0.3
March 2	45.11 0.08	20.6 2.5	42.90 0.03	82.0 1.1	11.11 0.07	29.4 0.5
12	45.03 0.01	18.1 2.7	42.87 0.01	80.9 1.3	11.04 0.03	28.9 0.7
22	45.02 0.06	15.4 2.5	42.86 0.04	79.6 1.6	11.01 0.00	28.2 1.0
April 1	45.08 0.13	12.9 2.3	42.90 0.08	78.0 1.9	11.01 0.04	27.2 1.2
11	45.21 0.20	10.6 1.9	42.98 0.12	76.1 2.0	11.05 0.08	26.0 1.5
21	45.41 0.27	8.7 1.7	43.10 0.16	74.1 2.2	11.13 0.12	24.5 1.6
May 1	45.68 0.33	7.0 1.2	43.26 0.20	71.9 2.3	11.25 0.16	22.9 1.8
11	46.01 0.40	5.8 0.7	43.46 0.24	69.6 2.3	11.41 0.20	21.1 2.0
21	46.41 0.43	5.1 0.2	43.70 0.27	67.3 2.4	11.61 0.24	19.1 2.1
31	46.84 0.46	4.9 0.3	43.97 0.30	64.9 2.3	11.85 0.27	17.0 2.2
June 10	47.30 0.49	5.2 0.7	44.27 0.31	62.6 2.2	12.12 0.28	14.8 2.1
20	47.79 0.49	5.9 1.2	44.58 0.33	60.4 2.0	12.40 0.31	12.7 2.0
30	48.28 0.48	7.1 1.5	44.91 0.32	58.4 1.8	12.71 0.31	10.7 2.0
July 10	48.76 0.46	8.6 2.0	45.23 0.32	56.6 1.6	13.02 0.31	8.7 1.8
20	49.22 0.43	10.6 2.4	45.55 0.29	55.0 1.2	13.33 0.30	6.9 1.6
30	49.65 0.39	13.0 2.6	45.84 0.28	53.8 1.0	13.63 0.29	5.3 1.3
Aug. 9	50.04 0.34	15.6 3.0	46.12 0.24	52.8 0.5	13.92 0.25	4.0 1.0
19	50.38 0.29	18.6 3.2	46.36 0.20	52.3 0.2	14.17 0.23	3.0 0.8
29	50.67 0.24	21.8 3.2	46.56 0.17	52.1 0.2	14.40 0.19	2.2 0.4
Sept. 8	50.91 0.19	25.0 3.2	46.73 0.13	52.3 0.4	14.59 0.17	1.8 0.0
18	51.10 0.14	28.2 3.2	46.86 0.09	52.7 0.8	14.76 0.13	1.8 0.2
28	51.24 0.07	31.4 3.1	46.95 0.05	53.5 1.0	14.89 0.10	2.0 0.4
Oct. 8	51.31 0.01	34.5 3.0	47.00 0.02	54.5 1.2	14.99 0.06	2.4 0.7
18	51.32 0.04	37.5 2.7	47.02 0.02	55.7 1.4	15.05 0.03	3.1 1.0
28	51.28 0.09	40.2 2.5	47.00 0.06	57.1 1.4	15.08 0.00	4.1 1.1
Nov. 7	51.19 0.14	42.7 2.1	46.94 0.07	58.5 1.4	15.08 0.03	5.2 1.1
17	51.05 0.18	44.8 1.7	46.87 0.09	59.9 1.3	15.05 0.05	6.3 1.1
27	50.87 0.21	46.5 1.2	46.78 0.11	61.2 1.2	15.00 0.07	7.4 1.1
Dec. 7	50.66 0.23	47.7 0.9	46.67 0.12	62.4 1.0	14.93 0.10	8.5 1.0
17	50.43 0.27	48.6 0.2	46.55 0.13	63.4 0.9	14.83 0.11	9.5 1.0
27	50.16 0.29	48.8 0.4	46.42 0.13	64.3 0.6	14.72 0.12	10.5 0.8
37	49.87	48.4	46.29	64.9	14.60	11.3

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sideral Day of the Month.	α Eridani. (Achernar.)		α ARISTIS.		γ Ceti.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 1 ^m 32	[°] 57 ['] 55	^h 1 ^m 59	[°] 22 ['] 48	^h 2 ^m 36	[°] 2 ['] 39
Jan. 1	37.44 0.35	73.0 0.3	29.10 0.12	56.8 0.5	13.97 0.10	25.7 0.8
11	37.09 0.34	73.3 0.2	28.98 0.14	56.3 0.5	13.87 0.12	24.9 0.8
21	36.75 0.33	73.1 0.8	28.84 0.15	55.8 0.7	13.75 0.14	24.1 0.6
31	36.42 0.32	72.3 1.3	28.69 0.15	55.1 0.8	13.61 0.15	23.5 0.5
Feb. 10	36.10 0.30	71.0 1.7	28.54 0.14	54.3 0.9	13.46 0.15	23.0 0.4
20	35.80 0.26	69.3 2.2	28.40 0.14	53.4 1.0	13.31 0.14	22.6 0.3
March 2	35.54 0.22	67.1 2.6	28.26 0.12	52.4 1.0	13.17 0.13	22.3 0.2
12	35.32 0.16	64.5 3.0	28.14 0.07	51.4 0.9	13.04 0.10	22.1 0.1
22	35.16 0.10	61.5 3.2	28.07 0.03	50.5 0.9	12.94 0.07	22.2 0.3
April 1	35.06 0.04	58.3 3.3	28.04 0.01	49.6 0.7	12.87 0.03	22.5 0.5
11	35.02 0.03	55.0 3.6	28.05 0.05	48.9 0.5	12.84 0.01	23.0 0.6
21	35.05 0.11	51.4 3.6	28.10 0.10	48.4 0.3	12.85 0.05	23.6 0.7
May 1	35.16 0.18	47.8 3.5	28.20 0.15	48.1 0.0	12.90 0.09	24.3 1.0
11	35.34 0.24	44.3 3.4	28.35 0.20	48.1 0.3	12.99 0.15	25.3 1.3
21	35.58 0.30	40.9 3.2	28.55 0.23	48.4 0.5	13.14 0.18	26.6 1.5
31	35.88 0.36	37.7 2.9	28.78 0.27	48.9 0.8	13.32 0.21	28.1 1.6
June 10	36.24 0.40	34.8 2.6	29.05 0.30	49.7 1.0	13.53 0.26	29.7 1.7
20	36.64 0.45	32.2 2.3	29.35 0.32	50.7 1.3	13.79 0.28	31.4 1.8
30	37.09 0.45	29.9 1.8	29.67 0.33	52.0 1.5	14.07 0.29	33.2 1.8
July 10	37.54 0.47	28.1 1.2	30.00 0.33	53.5 1.6	14.36 0.30	35.0 1.7
20	38.01 0.47	26.9 0.6	30.33 0.33	55.1 1.7	14.66 0.31	36.7 1.6
30	38.48 0.45	26.3 0.0	30.66 0.32	56.8 1.8	14.97 0.30	38.3 1.4
Aug. 9	38.93 0.42	26.3 0.4	30.98 0.29	58.6 1.7	15.27 0.28	39.7 1.3
19	39.35 0.38	26.7 1.1	31.27 0.27	60.3 1.7	15.55 0.27	41.0 1.2
29	39.73 0.34	27.8 1.6	31.54 0.25	62.0 1.7	15.82 0.25	42.2 0.9
Sept. 8	40.07 0.27	29.4 2.0	31.79 0.22	63.7 1.6	16.07 0.23	43.1 0.6
18	40.34 0.21	31.4 2.4	32.01 0.18	65.3 1.4	16.30 0.20	43.7 0.3
28	40.55 0.13	33.8 2.7	32.19 0.16	66.7 1.2	16.50 0.18	44.0 0.1
Oct. 8	40.68 0.07	36.5 2.9	32.35 0.12	67.9 1.1	16.68 0.14	44.1 0.2
18	40.75 0.02	39.4 3.0	32.47 0.08	69.0 1.0	16.82 0.11	43.9 0.4
28	40.73 0.07	42.4 2.9	32.55 0.06	70.0 0.8	16.93 0.08	43.5 0.4
Nov. 7	40.66 0.13	45.3 2.9	32.61 0.02	70.8 0.7	17.01 0.06	43.1 0.7
17	40.53 0.19	48.2 2.6	32.63 0.00	71.5 0.4	17.07 0.03	42.4 0.8
27	40.34 0.24	50.8 2.2	32.63 0.03	71.9 0.2	17.10 0.00	41.6 0.8
Dec. 7	40.10 0.29	53.0 1.8	32.60 0.06	72.1 0.0	17.10 0.03	40.8 0.9
17	39.81 0.32	54.8 1.2	32.54 0.09	72.1 0.1	17.07 0.07	39.9 0.8
27	39.49 0.34	56.0 0.7	32.45 0.12	72.0 0.3	17.00 0.10	39.1 0.8
37	39.15	56.7	32.33	71.7	16.90	38.3

after the 22d of March it begins at the Sideral Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α CETI.		α PERSEI.		γ TAURI.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h ^m 2 55	[°] 32'	^h ^m 3 14	49° 22'	^h ^m 3 39	23° 40'
Jan. 1	9.02 0.09	61.5 0.8	36.36 0.15	26.4 0.9	23.02 0.08	49.3 0.0
11	8.93 0.12	60.7 0.7	36.21 0.18	27.3 0.5	22.94 0.11	49.3 0.1
21	8.81 0.14	60.0 0.7	36.03 0.23	27.8 0.1	22.83 0.13	49.2 0.3
31	8.67 0.15	59.3 0.6	35.80 0.25	27.9 0.2	22.70 0.16	48.9 0.4
Feb. 10	8.52 0.15	58.7 0.4	35.55 0.26	27.7 0.6	22.54 0.17	48.5 0.5
20	8.37 0.15	58.3 0.2	35.29 0.25	27.1 1.0	22.37 0.18	48.0 0.6
March 2	8.22 0.14	58.1 0.1	35.04 0.24	26.1 1.3	22.19 0.17	47.4 0.6
12	8.08 0.12	58.0 0.0	34.80 0.21	24.8 1.4	22.02 0.15	46.8 0.6
22	7.96 0.08	58.0 0.0	34.59 0.16	23.4 1.7	21.87 0.13	46.2 0.7
April 1	7.88 0.05	58.0 0.3	34.43 0.12	21.7 1.8	21.74 0.09	45.5 0.6
11	7.83 0.01	58.3 0.6	34.31 0.05	19.9 1.9	21.65 0.05	44.9 0.6
21	7.82 0.04	58.9 0.8	34.26 0.01	18.0 1.9	21.60 0.00	44.3 0.5
May 1	7.86 0.08	59.7 1.0	34.27 0.09	16.1 1.8	21.60 0.05	43.8 0.3
11	7.94 0.12	60.7 1.2	34.36 0.17	14.3 1.5	21.65 0.10	43.5 0.1
21	8.06 0.17	61.9 1.2	34.53 0.24	12.8 1.3	21.75 0.15	43.4 0.0
31	8.23 0.20	63.1 1.5	34.77 0.29	11.5 1.0	21.90 0.19	43.4 0.2
June 10	8.43 0.24	64.6 1.6	35.06 0.33	10.5 0.7	22.09 0.23	43.6 0.5
20	8.67 0.27	66.2 1.7	35.39 0.37	9.8 0.3	22.32 0.26	44.1 0.6
30	8.94 0.29	67.9 1.7	35.76 0.41	9.5 0.0	22.58 0.30	44.7 0.7
July 10	9.23 0.29	69.6 1.7	36.17 0.43	9.5 0.3	22.88 0.31	45.4 0.9
20	9.52 0.29	71.3 1.6	36.60 0.44	9.8 0.5	23.19 0.31	46.3 1.0
30	9.81 0.31	72.9 1.5	37.04 0.43	10.3 0.9	23.50 0.32	47.3 1.1
Aug. 9	10.12 0.29	74.4 1.3	37.47 0.43	11.2 1.2	23.82 0.32	48.4 1.1
19	10.41 0.28	75.7 1.0	37.90 0.42	12.4 1.4	24.14 0.32	49.5 1.1
29	10.69 0.26	76.7 0.9	38.32 0.40	13.8 1.6	24.46 0.31	50.6 1.1
Sept. 8	10.95 0.25	77.6 0.6	38.72 0.38	15.4 1.8	24.77 0.29	51.7 1.0
18	11.20 0.22	78.2 0.4	39.10 0.35	17.2 1.8	25.06 0.27	52.7 0.9
28	11.42 0.19	78.6 0.1	39.45 0.31	19.0 2.1	25.33 0.25	53.6 0.8
Oct. 8	11.61 0.16	78.7 0.2	39.76 0.28	21.1 2.1	25.58 0.23	54.4 0.8
18	11.77 0.13	78.5 0.4	40.04 0.23	23.2 2.1	25.81 0.20	55.2 0.6
28	11.90 0.10	78.1 0.4	40.27 0.19	25.3 2.1	26.01 0.16	55.8 0.7
Nov. 7	12.00 0.07	77.7 0.6	40.46 0.15	27.4 2.0	26.17 0.13	56.5 0.5
17	12.07 0.05	77.1 0.8	40.61 0.09	29.4 2.0	26.30 0.10	57.0 0.3
27	12.12 0.01	76.3 0.9	40.70 0.03	31.4 1.8	26.40 0.07	57.3 0.3
Dec. 7	12.13 0.02	75.4 0.9	40.73 0.02	33.2 1.7	26.47 0.02	57.6 0.2
17	12.11 0.05	74.5 0.8	40.71 0.08	34.9 1.3	26.49 0.01	57.8 0.1
27	12.06 0.08	73.7 0.8	40.63 0.13	36.2 1.0	26.48 0.06	57.9 0.0
37	11.98	72.9	40.50	37.2	26.42	57.9

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal 0h. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ^1 Eridani.		α TAURI. (Aldebaran.)		α AURIGÆ. (Capella.)	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	$3^h 51^m$	$13^{\circ} 53'$	$4^h 28^m$	$16^{\circ} 13'$	$5^h 6^m$	$45^{\circ} 51'$
Jan. 1	40.22 0.08	66.2 1.5	6.19 0.03	52.4 0.3	37.79 0.02	19.5 1.3
11	40.14 0.11	67.7 1.3	6.10 0.08	52.1 0.3	37.77 0.08	20.8 1.1
21	40.03 0.14	69.0 1.0	6.02 0.11	51.8 0.3	37.69 0.13	21.9 0.9
31	39.89 0.16	70.0 0.7	5.91 0.14	51.5 0.3	37.56 0.18	22.8 0.7
Feb. 10	39.73 0.17	70.7 0.4	5.77 0.16	51.2 0.4	37.38 0.22	23.5 0.4
20	39.56 0.18	71.1 0.1	5.61 0.18	50.8 0.4	37.16 0.24	23.9 0.1
March 2	39.38 0.18	71.2 0.2	5.43 0.18	50.4 0.4	36.92 0.25	24.0 0.2
12	39.20 0.16	71.0 0.5	5.25 0.16	50.0 0.3	36.67 0.25	23.8 0.5
22	39.04 0.14	70.5 0.8	5.09 0.14	49.7 0.3	36.42 0.24	23.3 0.8
April 1	38.90 0.11	69.7 1.0	4.95 0.12	49.4 0.2	36.18 0.21	22.5 1.0
11	38.79 0.07	68.7 1.3	4.83 0.09	49.2 0.1	35.97 0.16	21.5 1.2
21	38.72 0.03	67.4 1.5	4.74 0.05	49.1 0.1	35.81 0.11	20.3 1.4
May 1	38.69 0.02	65.9 1.8	4.69 0.00	49.0 0.0	35.70 0.05	18.9 1.4
11	38.71 0.05	64.1 2.0	4.69 0.04	49.0 0.2	35.65 0.00	17.5 1.5
21	38.76 0.10	62.1 2.1	4.73 0.09	49.2 0.4	35.65 0.07	16.0 1.4
31	38.86 0.15	60.0 2.2	4.82 0.14	49.6 0.5	35.72 0.14	14.6 1.3
June 10	39.01 0.19	57.8 2.3	4.96 0.18	50.1 0.6	35.86 0.19	13.3 1.2
20	39.20 0.22	55.5 2.2	5.14 0.22	50.7 0.7	36.05 0.24	12.1 1.3
30	39.42 0.25	53.3 2.1	5.36 0.24	51.4 0.8	36.29 0.28	10.8 1.0
July 10	39.67 0.27	51.2 2.0	5.60 0.27	52.2 0.9	36.57 0.32	9.8 0.7
20	39.94 0.29	49.2 1.8	5.87 0.29	53.1 0.9	36.89 0.35	9.1 0.5
30	40.23 0.30	47.4 1.5	6.16 0.30	54.0 0.9	37.24 0.38	8.6 0.3
Aug. 9	40.53 0.29	45.9 1.2	6.46 0.30	54.9 0.9	37.62 0.40	8.3 0.1
19	40.82 0.28	44.7 0.9	6.76 0.30	55.8 0.8	38.02 0.40	8.2 0.0
29	41.10 0.28	43.8 0.5	7.06 0.30	56.6 0.7	38.42 0.42	8.2 0.2
Sept. 8	41.38 0.27	43.3 0.0	7.36 0.29	57.3 0.5	38.84 0.41	8.4 0.4
18	41.65 0.26	43.3 0.3	7.65 0.29	57.8 0.4	39.25 0.40	8.8 0.6
28	41.91 0.23	43.6 0.7	7.94 0.27	58.2 0.3	39.65 0.39	9.4 0.7
Oct. 8	42.14 0.20	44.3 1.1	8.21 0.25	58.5 0.2	40.04 0.37	10.1 0.8
18	42.34 0.18	45.4 1.3	8.46 0.23	58.7 0.1	40.41 0.35	10.9 1.0
28	42.52 0.15	46.7 1.5	8.69 0.20	58.8 0.0	40.76 0.32	11.9 1.1
Nov. 7	42.67 0.12	48.2 1.8	8.89 0.18	58.8 0.2	41.08 0.29	13.0 1.3
17	42.79 0.08	50.0 2.0	9.07 0.15	58.6 0.3	41.37 0.25	14.3 1.4
27	42.87 0.05	52.0 1.9	9.22 0.11	58.3 0.3	41.62 0.20	15.7 1.4
Dec. 7	42.92 0.01	53.9 1.9	9.33 0.07	58.0 0.3	41.82 0.14	17.1 1.4
17	42.93 0.03	55.8 1.7	9.40 0.03	57.7 0.4	41.96 0.08	18.5 1.4
27	42.90 0.07	57.5 1.7	9.43 0.02	57.3 0.3	42.04 0.01	19.9 1.3
37	42.83	59.2	9.41	57.0	42.05	21.2

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β ORIONIS. (Rigel.)			β TAURI.		δ ORIONIS.	
	Right Ascension.	Dec. South.		Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h 5 ^m 7	[°] 8 ['] 21		^h 5 ^m 17	[°] 28 ['] 29	^h 5 ^m 25	[°] 0 ['] 24
Jan. 1	59.51 0.01	50.9 1.7		40.76 0.01	16.3 0.3	2.89 0.00	16.7 1.3
11	59.50 0.06	52.6 1.4		40.77 0.04	16.6 0.3	2.89 0.04	18.0 1.1
21	59.44 0.10	54.0 1.2		40.73 0.09	16.9 0.3	2.85 0.08	19.1 1.0
31	59.34 0.14	55.2 1.0		40.64 0.13	17.2 0.1	2.77 0.12	20.1 0.8
Feb. 10	59.20 0.16	56.2 0.7		40.51 0.16	17.3 0.1	2.65 0.15	20.9 0.6
20	59.04 0.17	56.9 0.4		40.35 0.19	17.4 0.0	2.50 0.17	21.5 0.4
March 2	58.87 0.18	57.3 0.2		40.16 0.20	17.4 0.2	2.33 0.17	21.9 0.2
12	58.69 0.19	57.5 0.0		39.96 0.19	17.2 0.3	2.16 0.18	22.1 0.1
22	58.50 0.17	57.5 0.3		39.77 0.19	16.9 0.4	1.98 0.17	22.2 0.0
April 1	58.33 0.15	57.2 0.6		39.58 0.17	16.5 0.5	1.81 0.15	22.2 0.2
11	58.18 0.12	56.6 0.8		39.41 0.13	16.0 0.5	1.66 0.13	22.0 0.5
21	58.06 0.09	55.8 0.9		39.28 0.09	15.5 0.6	1.53 0.09	21.5 0.7
May 1	57.97 0.05	54.9 1.2		39.19 0.04	14.9 0.6	1.44 0.05	20.8 0.8
11	57.92 0.00	53.7 1.4		39.15 0.01	14.3 0.6	1.39 0.01	20.0 1.0
21	57.92 0.04	52.3 1.6		39.16 0.04	13.7 0.4	1.38 0.03	19.0 1.1
31	57.96 0.08	50.7 1.8		39.20 0.10	13.3 0.4	1.41 0.07	17.9 1.3
June 10	58.04 0.12	48.9 1.9		39.30 0.15	12.9 0.2	1.48 0.11	16.6 1.4
20	58.16 0.16	47.0 1.8		39.45 0.20	12.7 0.2	1.59 0.15	15.2 1.4
30	58.32 0.20	45.2 1.9		39.65 0.23	12.5 0.1	1.74 0.18	13.8 1.5
July 10	58.52 0.22	43.3 1.8		39.88 0.26	12.4 0.0	1.92 0.21	12.3 1.4
20	58.74 0.23	41.5 1.6		40.14 0.28	12.4 0.1	2.13 0.24	10.9 1.2
30	58.97 0.26	39.9 1.4		40.42 0.30	12.5 0.1	2.37 0.25	9.7 1.2
Aug. 9	59.23 0.27	38.5 1.2		40.72 0.31	12.6 0.2	2.62 0.26	8.5 1.0
19	59.50 0.28	37.3 1.1		41.03 0.32	12.8 0.3	2.88 0.28	7.5 0.9
29	59.78 0.29	36.2 0.6		41.35 0.33	13.1 0.3	3.16 0.29	6.6 0.5
Sept. 8	60.07 0.29	35.6 0.2		41.68 0.33	13.4 0.4	3.45 0.29	6.1 0.2
18	60.36 0.28	35.4 0.1		42.01 0.33	13.8 0.3	3.74 0.28	5.9 0.0
28	60.64 0.27	35.5 0.4		42.34 0.32	14.1 0.3	4.02 0.28	5.9 0.3
Oct. 8	60.91 0.25	35.9 0.9		42.66 0.30	14.4 0.3	4.30 0.27	6.2 0.6
18	61.16 0.24	36.8 1.2		42.96 0.29	14.7 0.2	4.57 0.25	6.8 0.9
28	61.40 0.22	38.0 1.4		43.25 0.27	14.9 0.3	4.82 0.23	7.7 1.1
Nov. 7	61.62 0.19	39.4 1.6		43.52 0.24	15.2 0.3	5.05 0.21	8.8 1.3
17	61.81 0.17	41.0 1.8		43.76 0.21	15.5 0.2	5.26 0.19	10.1 1.4
27	61.98 0.13	42.8 1.8		43.97 0.18	15.7 0.3	5.45 0.16	11.5 1.5
Dec. 7	62.11 0.09	44.6 1.9		44.15 0.13	16.0 0.3	5.61 0.11	13.0 1.5
17	62.20 0.05	46.5 1.8		44.28 0.08	16.3 0.4	5.72 0.06	14.5 1.4
27	62.25 0.00	48.3 1.7		44.36 0.04	16.7 0.3	5.78 0.03	15.9 1.3
37	62.25	50.0		44.40	17.0	5.81	17.2

Note. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Ob. q /ter the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Leporis.		δ ORIONIS.		α Columbæ.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 5 ^m 26	[°] 17 ['] 55	^h 5 ^m 29	[°] 1 ['] 17	^h 5 ^m 34	[°] 34 ['] 8
Jan. 1	43.61 0.01	28.1 2.1	18.09 0.01	36.4 1.3	43.76 0.03	62.3 2.7
11	43.60 0.06	30.2 1.8	18.10 0.03	37.7 1.2	43.73 0.09	65.0 2.5
21	43.54 0.10	32.0 1.6	18.07 0.08	38.9 1.0	43.64 0.13	67.5 2.2
31	43.44 0.14	33.6 1.3	17.99 0.11	39.9 0.8	43.51 0.17	69.7 1.7
Feb. 10	43.30 0.17	34.9 1.0	17.88 0.14	40.7 0.7	43.34 0.21	71.4 1.3
20	43.13 0.18	35.9 0.7	17.74 0.17	41.4 0.5	43.13 0.23	72.7 0.9
March 2	42.95 0.20	36.6 0.3	17.57 0.18	41.9 0.2	42.90 0.23	73.6 0.5
12	42.75 0.20	36.9 0.0	17.39 0.18	42.1 0.1	42.67 0.24	74.1 0.1
22	42.55 0.19	36.9 0.4	17.21 0.18	42.2 0.1	42.43 0.24	74.0 0.5
April 1	42.36 0.17	36.5 0.7	17.03 0.15	42.1 0.3	42.19 0.22	73.5 0.8
11	42.19 0.15	35.8 1.0	16.88 0.13	41.8 0.5	41.97 0.19	72.7 1.3
21	42.04 0.11	34.8 1.2	16.75 0.10	41.3 0.7	41.78 0.16	71.4 1.7
May 1	41.93 0.07	33.6 1.6	16.65 0.06	40.6 0.9	41.62 0.13	69.7 2.0
11	41.86 0.03	32.0 1.8	16.59 0.01	39.7 1.0	41.49 0.07	67.7 2.4
21	41.83 0.01	30.2 1.9	16.58 0.02	38.7 1.0	41.42 0.02	65.3 2.6
31	41.84 0.05	28.3 2.0	16.60 0.06	37.7 1.3	41.40 0.02	62.7 2.7
June 10	41.89 0.10	26.3 2.2	16.66 0.11	36.4 1.4	41.42 0.08	60.0 2.8
20	41.99 0.14	24.1 2.4	16.77 0.15	35.0 1.5	41.50 0.12	57.2 2.8
30	42.13 0.17	21.7 2.2	16.92 0.18	33.5 1.5	41.62 0.16	54.4 2.7
July 10	42.30 0.20	19.5 2.1	17.10 0.21	32.0 1.4	41.78 0.19	51.7 2.7
20	42.50 0.22	17.4 2.0	17.31 0.23	30.6 1.3	41.97 0.23	49.0 2.5
30	42.72 0.25	15.4 1.8	17.54 0.25	29.3 1.2	42.20 0.26	46.5 2.2
Aug. 9	42.97 0.27	13.6 1.5	17.79 0.26	28.1 1.0	42.46 0.29	44.3 1.8
19	43.24 0.28	12.1 1.1	18.05 0.28	27.1 0.9	42.75 0.30	42.5 1.3
29	43.52 0.29	11.0 0.8	18.33 0.28	26.2 0.6	43.05 0.31	41.2 0.9
Sept. 8	43.81 0.29	10.2 0.3	18.61 0.29	25.6 0.2	43.36 0.32	40.3 0.3
18	44.10 0.29	9.9 0.3	18.90 0.28	25.4 0.0	43.68 0.32	40.0 0.2
28	44.39 0.29	10.2 0.6	19.18 0.28	25.4 0.4	44.00 0.31	40.2 0.8
Oct. 8	44.68 0.28	10.8 1.1	19.46 0.27	25.8 0.6	44.31 0.30	41.0 1.4
18	44.96 0.25	11.9 1.5	19.73 0.26	26.4 0.9	44.61 0.27	42.4 1.9
28	45.21 0.23	13.4 1.8	19.99 0.24	27.3 1.2	44.88 0.25	44.3 2.2
Nov. 7	45.44 0.21	15.2 2.0	20.23 0.21	28.5 1.3	45.13 0.22	46.5 2.7
17	45.65 0.17	17.2 2.3	20.44 0.18	29.8 1.5	45.35 0.19	49.2 2.9
27	45.82 0.14	19.5 2.4	20.62 0.16	31.3 1.5	45.54 0.15	52.1 3.0
Dec. 7	45.96 0.10	21.9 2.4	20.78 0.12	32.8 1.5	45.69 0.10	55.1 3.1
17	46.06 0.06	24.3 2.4	20.90 0.07	34.3 1.5	45.79 0.04	58.2 3.0
27	46.12 0.00	26.7 2.2	20.97 0.03	35.8 1.4	45.83 0.02	61.2 2.9
37	46.12	28.9	21.00	37.2	45.81	64.1

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α ORIONIS.		μ Geminorum.		α Argus. (Canopus)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h ₅ ^m ₄₇	[°] ₇ ['] ₂₂	^h ₆ ^m ₁₄	[°] ₂₂ ['] ₃₄	^h ₆ ^m ₂₀	[°] ₅₂ ['] ₃₇
Jan. 1	47.76 0.03	37.7 0.9	43.06 0.06	45.0 0.0	57.48 0.03	25.0 3.5
11	47.79 0.02	36.8 0.8	43.12 0.02	45.0 0.0	57.45 0.11	28.5 3.2
21	47.77 0.05	36.0 0.7	43.14 0.03	45.0 0.0	57.34 0.17	31.7 2.9
31	47.72 0.10	35.3 0.5	43.11 0.08	45.0 0.1	57.17 0.23	34.6 2.5
Feb. 10	47.62 0.14	34.8 0.5	43.03 0.12	45.1 0.1	56.94 0.28	37.1 2.0
20	47.48 0.16	34.3 0.3	42.91 0.16	45.2 0.1	56.66 0.32	39.1 1.6
March 2	47.32 0.17	34.0 0.2	42.75 0.18	45.3 0.0	56.34 0.35	40.7 1.0
12	47.15 0.18	33.8 0.2	42.57 0.19	45.3 0.0	55.99 0.36	41.7 0.5
22	46.97 0.18	33.6 0.0	42.38 0.19	45.3 0.0	55.63 0.36	42.2 0.0
April 1	46.79 0.16	33.6 0.1	42.19 0.18	45.3 0.1	55.27 0.35	42.2 0.5
11	46.63 0.13	33.7 0.2	42.01 0.16	45.2 0.2	54.92 0.33	41.7 0.9
21	46.50 0.11	33.9 0.3	41.85 0.12	45.0 0.2	54.59 0.28	40.8 1.5
May 1	46.39 0.07	34.2 0.4	41.73 0.09	44.8 0.3	54.31 0.24	39.3 1.9
11	46.32 0.02	34.6 0.6	41.64 0.05	44.5 0.2	54.07 0.20	37.4 2.3
21	46.30 0.02	35.2 0.7	41.59 0.00	44.3 0.1	53.87 0.16	35.1 2.6
31	46.32 0.05	35.9 0.8	41.59 0.05	44.2 0.2	53.71 0.09	32.5 2.9
June 10	46.37 0.10	36.7 0.9	41.64 0.08	44.0 0.1	53.62 0.02	29.6 3.0
20	46.47 0.14	37.6 0.9	41.72 0.12	43.9 0.0	53.60 0.05	26.6 3.1
30	46.61 0.17	38.5 1.0	41.84 0.16	43.9 0.0	53.65 0.10	23.5 3.2
July 10	46.78 0.20	39.5 0.9	42.00 0.20	43.9 0.0	53.75 0.16	20.3 3.0
20	46.98 0.23	40.4 0.9	42.20 0.23	43.9 0.1	53.91 0.21	17.3 2.9
30	47.21 0.25	41.3 0.8	42.43 0.25	44.0 0.0	54.12 0.26	14.4 2.7
Aug. 9	47.46 0.25	42.1 0.8	42.68 0.27	44.0 0.0	54.38 0.30	11.7 2.3
19	47.71 0.27	42.9 0.6	42.95 0.28	44.0 0.1	54.68 0.33	9.4 1.9
29	47.98 0.29	43.5 0.4	43.23 0.29	44.1 0.0	55.01 0.36	7.5 1.5
Sept. 8	48.27 0.29	43.9 0.1	43.52 0.31	44.1 0.1	55.37 0.40	6.0 0.7
18	48.56 0.29	44.0 0.0	43.83 0.32	44.0 0.3	55.77 0.41	5.3 0.0
28	48.85 0.29	44.0 0.3	44.15 0.32	43.7 0.3	56.18 0.41	5.3 0.5
Oct. 8	49.14 0.28	43.7 0.5	44.47 0.31	43.4 0.3	56.59 0.40	5.8 1.2
18	49.42 0.27	43.2 0.7	44.78 0.31	43.1 0.4	56.99 0.38	7.0 1.7
28	49.69 0.25	42.5 0.9	45.09 0.30	42.7 0.4	57.37 0.35	8.7 2.2
Nov. 7	49.94 0.24	41.6 1.0	45.39 0.28	42.3 0.4	57.72 0.32	10.9 2.8
17	50.18 0.21	40.6 1.0	45.67 0.25	41.9 0.3	58.04 0.28	13.7 3.2
27	50.39 0.19	39.6 1.1	45.92 0.22	41.6 0.3	58.32 0.21	16.9 3.4
Dec. 7	50.58 0.14	38.5 1.0	46.14 0.18	41.3 0.3	58.53 0.15	20.3 3.5
17	50.72 0.10	37.5 1.0	46.32 0.14	41.0 0.2	58.68 0.08	23.8 3.6
27	50.82 0.04	36.5 0.9	46.46 0.09	40.8 0.1	58.78 0.00	27.4 3.5
37	50.86	35.6	46.55	40.7	58.76	30.9

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal 6h. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	51 (Hav.) Cephei.		α CANIS MAJORIS. (Sirius.)		β Canis Majoris.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h ^m 6 35	[°] ['] 87 14	^h ^m 6 39	[°] ['] 16 31	^h ^m 6 53	[°] ['] 28 47
Jan. 1	48.03 0.34	41.1 3.2	9.13 0.06	55.3 2.4	16.92 0.06	22.8 3.0
11	48.37 0.59	44.3 3.1	9.19 0.01	57.7 2.2	16.98 0.01	25.8 2.8
21	47.78 1.49	47.4 2.9	9.20 0.04	59.9 2.0	16.99 0.05	28.6 2.5
31	46.29 2.30	50.3 2.6	9.16 0.09	61.9 1.7	16.94 0.09	31.1 2.2
Feb. 10	43.99 3.01	52.9 2.2	9.07 0.12	63.6 1.3	16.85 0.14	33.3 1.9
20	40.98 3.59	55.1 1.8	8.95 0.15	64.9 1.1	16.71 0.17	35.2 1.5
March 2	37.39 4.02	56.9 1.2	8.80 0.18	66.0 0.8	16.54 0.20	36.7 1.1
12	33.37 4.26	58.1 0.5	8.62 0.20	66.8 0.5	16.34 0.22	37.8 0.7
22	29.11 4.34	58.6 0.0	8.42 0.20	67.3 0.1	16.12 0.22	38.5 0.2
April 1	24.77 4.25	58.6 0.6	8.22 0.19	67.4 0.2	15.90 0.22	38.7 0.2
11	20.52 3.98	58.0 1.1	8.03 0.18	67.2 0.5	15.68 0.20	38.5 0.6
21	16.54 3.56	56.9 1.8	7.85 0.15	66.7 0.8	15.48 0.18	37.9 0.9
May 1	12.98 3.02	55.1 2.3	7.70 0.12	65.9 1.1	15.30 0.15	37.0 1.3
11	9.96 2.39	52.8 2.5	7.58 0.09	64.8 1.3	15.15 0.12	35.7 1.5
21	7.57 1.68	50.3 2.8	7.49 0.04	63.5 1.5	15.03 0.08	34.2 1.9
31	5.89 0.92	47.5 3.1	7.45 0.00	62.0 1.8	14.95 0.04	32.3 2.1
June 10	4.97 0.14	44.4 3.2	7.45 0.03	60.2 1.9	14.91 0.00	30.2 2.3
20	4.83 0.65	41.2 3.0	7.48 0.06	58.3 1.9	14.91 0.05	27.9 2.5
30	5.48 1.41	38.2 3.1	7.54 0.10	56.4 2.0	14.96 0.09	25.4 2.6
July 10	6.89 2.14	35.1 3.0	7.64 0.14	54.4 2.0	15.05 0.11	22.8 2.5
20	9.03 2.83	32.1 2.9	7.78 0.17	52.4 1.9	15.16 0.15	20.3 2.3
30	11.86 3.44	29.2 2.6	7.95 0.20	50.5 1.6	15.31 0.19	18.0 2.1
Aug. 9	15.30 3.97	26.6 2.4	8.15 0.21	48.9 1.5	15.50 0.21	15.9 1.9
19	19.27 4.43	24.2 1.9	8.36 0.25	47.4 1.3	15.71 0.24	14.0 1.6
29	23.70 4.82	22.3 1.5	8.61 0.26	46.1 0.8	15.95 0.27	12.4 1.3
Sept. 8	28.52 5.10	20.8 1.2	8.87 0.28	45.3 0.4	16.22 0.29	11.1 0.8
18	33.62 5.28	19.6 0.6	9.15 0.29	44.9 0.0	16.51 0.30	10.3 0.2
28	38.90 5.35	19.0 0.1	9.44 0.29	44.9 0.5	16.81 0.31	10.1 0.4
Oct. 8	44.25 5.32	18.9 0.3	9.73 0.29	45.4 0.8	17.12 0.32	10.5 0.7
18	49.57 5.17	19.2 0.6	10.02 0.29	46.2 1.3	17.44 0.31	11.2 1.4
28	54.74 4.90	19.8 1.1	10.31 0.28	47.5 1.7	17.75 0.30	12.6 1.9
Nov. 7	59.64 4.50	20.9 1.8	10.59 0.26	49.2 2.0	18.05 0.28	14.5 2.2
17	64.14 3.97	22.7 2.2	10.85 0.24	51.2 2.3	18.33 0.25	16.7 2.6
27	68.11 3.34	24.9 2.5	11.09 0.20	53.5 2.5	18.58 0.22	19.3 2.8
Dec. 7	71.45 2.60	27.4 2.9	11.29 0.18	56.0 2.5	18.80 0.19	22.1 2.9
17	74.05 1.78	30.3 3.0	11.47 0.13	58.5 2.5	18.99 0.14	25.0 3.1
27	75.83 0.88	33.3 3.1	11.60 0.08	61.0 2.5	19.13 0.09	28.1 3.0
37	76.71	36.4	11.68	63.5	19.22	31.1

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	δ Geminorum.		α^3 GEMINORUM. (Castor.)		α CANIS MINORIS. (Procyon.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 7 ^m 11	[°] 22 ['] 13	^h 7 ^m 25	[°] 32 ['] 10	^h 7 ^m 32	[°] 5 ['] 34
Jan. 1	59.06 0.13	45.2 0.2	53.83 0.15	57.5 0.4	10.14 0.13	17.5 1.3
11	59.19 0.07	45.0 0.1	53.98 0.09	57.9 0.5	10.27 0.08	16.2 1.1
21	59.26 0.02	44.9 0.0	54.07 0.03	58.4 0.6	10.35 0.03	15.1 1.0
31	59.28 0.04	44.9 0.1	54.10 0.03	59.0 0.7	10.38 0.02	14.1 0.8
Feb. 10	59.24 0.08	45.0 0.3	54.07 0.08	59.7 0.8	10.36 0.07	13.3 0.6
20	59.16 0.12	45.3 0.3	53.99 0.13	60.5 0.7	10.29 0.10	12.7 0.5
March 2	59.04 0.15	45.6 0.2	53.86 0.16	61.2 0.6	10.19 0.14	12.2 0.3
12	58.89 0.18	45.8 0.3	53.70 0.18	61.8 0.5	10.05 0.16	11.9 0.1
22	58.71 0.19	46.1 0.2	53.52 0.19	62.3 0.4	9.89 0.17	11.8 0.1
April 1	58.52 0.19	46.3 0.1	53.33 0.20	62.7 0.2	9.72 0.17	11.7 0.1
11	58.33 0.17	46.4 0.1	53.13 0.19	62.9 0.1	9.55 0.16	11.8 0.2
21	58.16 0.15	46.5 0.0	52.94 0.18	63.0 0.1	9.39 0.15	12.0 0.3
May 1	58.01 0.12	46.5 0.0	52.76 0.15	62.9 0.3	9.24 0.13	12.3 0.4
11	57.89 0.09	46.5 0.1	52.61 0.11	62.6 0.4	9.11 0.09	12.7 0.5
21	57.80 0.05	46.4 0.2	52.50 0.07	62.2 0.5	9.02 0.07	13.2 0.6
31	57.75 0.01	46.2 0.1	52.43 0.02	61.7 0.6	8.95 0.03	13.8 0.6
June 10	57.74 0.03	46.1 0.2	52.41 0.02	61.1 0.7	8.92 0.01	14.4 0.7
20	57.77 0.07	45.9 0.1	52.43 0.05	60.4 0.8	8.93 0.04	15.1 0.7
30	57.84 0.11	45.8 0.2	52.48 0.10	59.6 0.8	8.97 0.06	15.8 0.8
July 10	57.95 0.14	45.6 0.1	52.58 0.13	58.8 0.8	9.03 0.11	16.6 0.7
20	58.09 0.17	45.5 0.2	52.71 0.17	58.0 0.8	9.14 0.14	17.3 0.6
30	58.26 0.19	45.3 0.3	52.88 0.20	57.2 0.9	9.28 0.16	17.9 0.6
Aug. 9	58.45 0.22	45.0 0.3	53.08 0.22	56.3 0.9	9.44 0.19	18.5 0.4
19	58.67 0.25	44.7 0.3	53.30 0.26	55.4 0.8	9.63 0.21	18.9 0.3
29	58.92 0.27	44.4 0.4	53.56 0.29	54.6 0.9	9.84 0.23	19.2 0.1
Sept. 8	59.19 0.29	44.0 0.5	53.85 0.30	53.7 0.9	10.07 0.25	19.3 0.2
18	59.48 0.30	43.5 0.6	54.15 0.32	52.8 0.8	10.32 0.27	19.1 0.4
28	59.78 0.31	42.9 0.7	54.47 0.34	52.0 0.9	10.59 0.29	18.7 0.6
Oct. 8	60.09 0.32	42.2 0.8	54.81 0.35	51.1 0.8	10.88 0.29	18.1 0.9
18	60.41 0.32	41.4 0.8	55.16 0.35	50.3 0.8	11.17 0.29	17.2 1.1
28	60.73 0.32	40.6 0.8	55.51 0.35	49.5 0.7	11.46 0.30	16.1 1.2
Nov. 7	61.05 0.31	39.8 0.8	55.86 0.35	48.8 0.6	11.76 0.30	14.9 1.5
17	61.36 0.30	39.0 0.7	56.21 0.32	48.2 0.4	12.06 0.28	13.4 1.5
27	61.66 0.28	38.3 0.6	56.53 0.30	47.8 0.2	12.34 0.27	11.9 1.6
Dec. 7	61.94 0.24	37.7 0.6	56.83 0.28	47.6 0.1	12.61 0.23	10.3 1.5
17	62.18 0.19	37.1 0.4	57.11 0.22	47.5 0.1	12.84 0.19	8.8 1.5
27	62.37 0.14	36.7 0.3	57.33 0.17	47.6 0.3	13.03 0.15	7.3 1.4
37	62.51	36.4	57.50	47.9	13.18	5.9

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β Geminorum. (Pollux.)		15 Argus.		• Hydræ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 7 ^m 36	28° 20'	^h 8 ^m 1	23° 54'	^h 8 ^m 39	6° 54'
Jan. 1	58.43 0.16	64.2 0.1	44.94 0.15	45.8 2.9	33.48 0.20	60.0 1.4
11	58.59 0.10	64.3 0.3	45.09 0.09	48.7 2.8	33.68 0.15	58.6 1.2
21	58.69 0.04	64.6 0.4	45.18 0.03	51.5 2.7	33.83 0.09	57.4 1.1
31	58.73 0.01	65.0 0.5	45.21 0.02	54.2 2.4	33.92 0.05	56.3 0.8
Feb. 10	58.72 0.06	65.5 0.6	45.19 0.06	56.6 2.1	33.97 0.01	55.5 0.6
20	58.66 0.11	66.1 0.6	45.13 0.11	58.7 1.8	33.96 0.05	54.9 0.4
March 2	58.55 0.15	66.7 0.6	45.02 0.15	60.5 1.4	33.91 0.08	54.5 0.2
12	58.40 0.18	67.3 0.5	44.87 0.17	61.9 1.1	33.83 0.12	54.3 0.1
22	58.22 0.20	67.8 0.4	44.70 0.18	63.0 0.7	33.71 0.14	54.2 0.1
April 1	58.02 0.20	68.2 0.3	44.52 0.20	63.7 0.3	33.57 0.15	54.3 0.2
11	57.82 0.18	68.5 0.1	44.32 0.20	64.0 0.0	33.42 0.16	54.5 0.3
21	57.64 0.16	68.6 0.0	44.12 0.18	64.0 0.4	33.26 0.16	54.8 0.3
May 1	57.48 0.14	68.6 0.1	43.94 0.16	63.6 0.7	33.10 0.14	55.1 0.4
11	57.34 0.11	68.5 0.2	43.78 0.14	62.9 1.1	32.96 0.12	55.5 0.5
21	57.23 0.08	68.3 0.4	43.64 0.11	61.8 1.3	32.84 0.10	56.0 0.5
31	57.15 0.04	67.9 0.4	43.53 0.08	60.5 1.5	32.74 0.07	56.5 0.5
June 10	57.11 0.01	67.5 0.5	43.45 0.04	59.0 1.7	32.67 0.04	57.0 0.5
20	57.12 0.05	67.0 0.6	43.41 0.01	57.3 2.0	32.63 0.01	57.5 0.6
30	57.17 0.08	66.4 0.6	43.40 0.02	55.3 2.1	32.62 0.02	58.1 0.5
July 10	57.25 0.12	65.8 0.6	43.42 0.06	53.2 2.2	32.64 0.05	58.6 0.5
20	57.37 0.14	65.2 0.6	43.48 0.09	51.0 2.1	32.69 0.07	59.1 0.4
30	57.51 0.18	64.6 0.7	43.57 0.12	48.9 2.0	32.76 0.10	59.5 0.4
Aug. 9	57.69 0.21	63.9 0.7	43.69 0.15	46.9 1.9	32.86 0.12	59.9 0.3
19	57.90 0.23	63.2 0.7	43.84 0.18	45.0 1.6	32.98 0.16	60.2 0.0
29	58.13 0.27	62.5 0.8	44.02 0.21	43.4 1.3	33.14 0.18	60.2 0.1
Sept. 8	58.40 0.29	61.7 0.9	44.23 0.24	42.1 0.9	33.32 0.21	60.1 0.3
18	58.69 0.31	60.8 0.9	44.47 0.27	41.2 0.4	33.53 0.24	59.8 0.5
28	59.00 0.31	59.9 0.9	44.74 0.29	40.7 0.1	33.77 0.25	59.3 0.8
Oct. 8	59.31 0.33	59.0 0.9	45.03 0.29	40.9 0.5	34.02 0.28	58.5 1.0
18	59.64 0.34	58.1 0.9	45.32 0.31	41.4 0.9	34.30 0.30	57.5 1.3
28	59.98 0.34	57.2 0.9	45.63 0.31	42.3 1.4	34.60 0.31	56.2 1.5
Nov. 7	60.32 0.33	56.3 0.8	45.94 0.32	43.8 1.9	34.91 0.32	54.7 1.6
17	60.65 0.33	55.5 0.7	46.26 0.31	45.6 2.3	35.23 0.31	53.1 1.7
27	60.98 0.30	54.8 0.5	46.57 0.29	47.9 2.6	35.54 0.30	51.4 1.7
Dec. 7	61.28 0.27	54.3 0.4	46.86 0.25	50.5 2.8	35.84 0.28	49.7 1.7
17	61.55 0.23	53.9 0.2	47.11 0.20	53.3 2.9	36.12 0.25	48.0 1.6
27	61.78 0.18	53.7 0.1	47.31 0.16	56.2 2.9	36.37 0.21	46.4 1.5
37	61.96	53.8 0	47.47	59.1	36.58	44.9

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	♌ URSÆ Majoris.		♐ ARGUS.		♒ HYDRÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 8 ^m 49	48° 34'	^h 9 ^m 13	58° 41'	^h 9 ^m 20	8° 4'
Jan. 1	51.66 0.28	20.5 0.9	28.18 0.27	59.7 3.8	53.33 0.23	7.2 2.3
11	51.94 0.22	21.4 1.2	28.45 0.19	63.5 3.8	53.56 0.18	9.5 2.2
21	52.16 0.15	22.6 1.5	28.64 0.11	67.3 3.8	53.74 0.13	11.7 2.0
31	52.31 0.07	24.1 1.7	28.75 0.03	71.1 3.8	53.87 0.08	13.7 1.8
Feb. 10	52.38 0.00	25.8 1.8	28.78 0.06	74.9 3.6	53.95 0.03	15.5 1.5
20	52.38 0.07	27.6 1.7	28.72 0.13	78.5 3.4	53.98 0.01	17.0 1.3
March 2	52.31 0.13	29.3 1.7	28.59 0.20	81.9 3.1	53.97 0.06	18.3 1.1
12	52.18 0.18	31.0 1.5	28.39 0.25	85.0 2.7	53.91 0.09	19.4 0.8
22	52.00 0.22	32.5 1.3	28.14 0.30	87.7 2.2	53.82 0.12	20.2 0.5
April 1	51.78 0.24	33.8 1.0	27.84 0.33	89.9 1.8	53.70 0.13	20.7 0.3
11	51.54 0.26	34.8 0.8	27.51 0.34	91.7 1.3	53.57 0.15	21.0 0.0
21	51.28 0.25	35.6 0.4	27.17 0.36	93.0 0.8	53.42 0.15	21.0 0.2
May 1	51.03 0.24	36.0 0.0	26.81 0.36	93.8 0.3	53.27 0.14	20.8 0.4
11	50.79 0.22	36.0 0.3	26.45 0.35	94.1 0.2	53.13 0.13	20.4 0.5
21	50.57 0.18	35.7 0.7	26.10 0.33	98.9 0.8	53.00 0.11	19.9 0.7
31	50.39 0.14	35.0 0.9	25.77 0.30	93.1 1.1	52.89 0.10	19.2 0.8
June 10	50.25 0.10	34.1 1.2	25.47 0.26	92.0 1.6	52.79 0.07	18.4 0.9
20	50.15 0.05	32.9 1.3	25.21 0.21	90.4 2.1	52.72 0.05	17.5 1.0
30	50.10 0.01	31.6 1.6	25.00 0.17	88.3 2.4	52.67 0.03	16.5 1.2
July 10	50.09 0.04	30.0 1.9	24.83 0.12	85.9 2.6	52.64 0.00	15.3 1.2
20	50.13 0.08	28.1 2.0	24.71 0.06	83.3 2.9	52.64 0.04	14.1 1.2
30	50.21 0.12	26.1 2.0	24.65 0.00	80.4 3.0	52.68 0.06	12.9 1.1
Aug. 9	50.33 0.16	24.1 2.1	24.65 0.07	77.4 3.0	52.74 0.07	11.8 1.1
19	50.49 0.21	22.0 2.2	24.72 0.14	74.4 2.8	52.81 0.11	10.7 0.9
29	50.70 0.25	19.8 2.1	24.86 0.20	71.6 2.6	52.92 0.15	9.8 0.6
Sept. 8	50.95 0.29	17.7 2.2	25.06 0.28	69.0 2.4	53.07 0.17	9.2 0.3
18	51.24 0.33	15.5 2.1	25.34 0.33	66.6 1.9	53.24 0.20	8.9 0.0
28	51.57 0.35	13.4 1.9	25.67 0.38	64.7 1.5	53.44 0.23	8.9 0.3
Oct. 8	51.92 0.39	11.5 1.8	26.05 0.43	63.2 0.8	53.67 0.26	9.2 0.6
18	52.31 0.42	9.7 1.6	26.48 0.47	62.4 0.2	53.93 0.28	9.7 1.0
28	52.73 0.43	8.1 1.3	26.95 0.50	62.2 0.4	54.21 0.29	10.7 1.4
Nov. 7	53.16 0.45	6.8 1.2	27.45 0.50	62.6 1.1	54.50 0.32	12.1 1.6
17	53.61 0.45	5.6 0.8	27.95 0.50	63.7 1.7	54.82 0.32	13.7 1.9
27	54.06 0.44	4.8 0.4	28.45 0.47	65.4 2.4	55.14 0.31	15.6 2.1
Dec. 7	54.50 0.40	4.4 0.0	28.92 0.44	67.8 2.8	55.45 0.30	17.7 2.3
17	54.90 0.35	4.4 0.4	29.36 0.38	70.6 3.1	55.75 0.28	20.0 2.3
27	55.25 0.30	4.8 0.8	29.74 0.30	73.7 3.5	56.03 0.24	22.3 2.3
37	55.55	5.6	30.04	77.2	56.27	24.6

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon ;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	δ Ursæ Majoris.		ε Leonis.		α LEONIS. (Regulus.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 9 ^m 23	52° 17'	^h 9 ^m 38	24° 23'	^h 10 ^m 1	12° 37'
Jan. 1	43.34 0.35	38.7 0.9	6.38 0.26	57.4 0.7	6.31 0.26	54.7 1.4
11	43.69 0.27	39.6 1.2	6.64 0.22	56.7 0.4	6.57 0.23	53.3 1.1
21	43.96 0.20	40.8 1.5	6.86 0.17	56.3 0.1	6.80 0.18	52.2 0.9
31	44.16 0.13	42.3 1.8	7.03 0.12	56.2 0.2	6.98 0.13	51.3 0.6
Feb. 10	44.29 0.04	44.1 2.0	7.15 0.06	56.4 0.4	7.11 0.08	50.7 0.4
20	44.33 0.04	46.1 2.0	7.21 0.01	56.8 0.6	7.19 0.03	50.3 0.1
March 2	44.29 0.10	48.1 2.0	7.22 0.04	57.4 0.7	7.22 0.02	50.2 0.1
12	44.19 0.16	50.1 1.9	7.18 0.08	58.1 0.8	7.20 0.05	50.3 0.3
22	44.03 0.21	52.0 1.6	7.10 0.11	58.9 0.9	7.15 0.08	50.6 0.4
April 1	43.82 0.24	53.6 1.4	6.99 0.14	59.8 0.9	7.07 0.11	51.0 0.5
11	43.58 0.27	55.0 1.1	6.85 0.15	60.7 0.7	6.96 0.12	51.5 0.6
21	43.31 0.28	56.1 0.8	6.70 0.16	61.4 0.7	6.84 0.14	52.1 0.6
May 1	43.03 0.28	56.9 0.4	6.54 0.16	62.1 0.6	6.70 0.14	52.7 0.6
11	42.75 0.25	57.3 0.1	6.38 0.15	62.7 0.5	6.56 0.13	53.3 0.5
21	42.50 0.22	57.2 0.5	6.23 0.12	63.2 0.3	6.43 0.12	53.8 0.5
31	42.28 0.19	56.7 0.8	6.11 0.11	63.5 0.1	6.31 0.11	54.3 0.5
June 10	42.09 0.15	55.9 1.1	6.00 0.08	63.6 0.0	6.20 0.09	54.8 0.4
20	41.94 0.11	54.8 1.4	5.92 0.06	63.6 0.2	6.11 0.07	55.2 0.3
30	41.83 0.07	53.4 1.7	5.86 0.03	63.4 0.3	6.04 0.04	55.5 0.2
July 10	41.76 0.02	51.7 1.9	5.83 0.00	63.1 0.5	6.00 0.02	55.7 0.1
20	41.74 0.02	49.8 2.2	5.83 0.02	62.6 0.6	5.98 0.00	55.8 0.0
30	41.76 0.07	47.6 2.3	5.85 0.04	62.0 0.8	5.98 0.02	55.8 0.1
Aug. 9	41.83 0.12	45.3 2.4	5.89 0.08	61.2 0.9	6.00 0.05	55.7 0.2
19	41.95 0.17	42.9 2.5	5.97 0.11	60.3 1.0	6.05 0.08	55.5 0.4
29	42.12 0.21	40.4 2.5	6.08 0.14	59.3 1.2	6.13 0.12	55.1 0.5
Sept. 8	42.33 0.26	37.9 2.6	6.22 0.18	58.1 1.4	6.25 0.14	54.6 0.8
18	42.59 0.31	35.3 2.5	6.40 0.20	56.7 1.6	6.39 0.17	53.8 1.1
28	42.90 0.34	32.8 2.4	6.60 0.24	55.1 1.7	6.56 0.20	52.7 1.3
Oct. 8	43.24 0.39	30.4 2.2	6.84 0.27	53.4 1.7	6.76 0.24	51.4 1.4
18	43.63 0.42	28.2 2.0	7.11 0.29	51.7 1.7	7.00 0.27	50.0 1.5
28	44.05 0.44	26.2 1.7	7.40 0.32	50.0 1.8	7.27 0.29	48.5 1.8
Nov. 7	44.49 0.47	24.5 1.4	7.72 0.33	48.2 1.8	7.56 0.31	46.7 1.9
17	44.96 0.47	23.1 1.1	8.05 0.35	46.4 1.7	7.87 0.32	44.8 1.8
27	45.43 0.46	22.0 0.8	8.40 0.35	44.7 1.6	8.19 0.33	43.0 1.9
Dec. 7	45.89 0.46	21.2 0.2	8.75 0.33	43.1 1.3	8.52 0.32	41.1 1.8
17	46.35 0.41	21.0 0.2	9.06 0.31	41.8 1.2	8.84 0.31	39.3 1.7
27	46.76 0.36	21.2 0.6	9.39 0.28	40.6 0.8	9.15 0.27	37.6 1.5
37	47.12	21.8	9.67	39.8	9.42	36.1

after the 23d of March it begins at the Sidereal On. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ Argus.		α URSE MAJORIS.		δ LEONIS.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 10 ^m 39	[°] 58 ['] 57	^h 10 ^m 55	[°] 62 ['] 28	^h 11 ^m 6	[°] 21 ['] 15
Jan. 1	47.62 0.42	44.6 3.2	17.04 0.53	58.4 0.4	50.74 0.32	70.0 1.4
11	48.04 0.36	47.8 3.4	17.57 0.48	58.8 0.9	51.06 0.29	68.6 1.0
21	48.40 0.28	51.2 3.6	18.05 0.41	59.7 1.4	51.35 0.24	67.6 0.6
31	48.68 0.21	54.8 3.7	18.46 0.32	61.1 1.9	51.59 0.20	67.0 0.3
Feb. 10	48.89 0.13	58.5 3.8	18.78 0.22	63.0 2.2	51.79 0.15	66.7 0.1
20	49.02 0.05	62.3 3.7	19.00 0.13	65.2 2.5	51.94 0.11	66.8 0.3
March 2	49.07 0.03	66.0 3.5	19.13 0.04	67.7 2.6	52.05 0.05	67.1 0.6
12	49.04 0.09	69.5 3.3	19.17 0.06	70.3 2.7	52.10 0.01	67.7 0.9
22	48.95 0.14	72.8 3.0	19.11 0.15	73.0 2.6	52.11 0.03	68.6 1.0
April 1	48.81 0.20	75.8 2.7	18.96 0.22	75.6 2.4	52.08 0.06	69.6 1.0
11	48.61 0.24	78.5 2.2	18.74 0.26	78.0 2.1	52.02 0.09	70.6 1.1
21	48.37 0.28	80.7 1.8	18.48 0.32	80.1 1.7	51.93 0.11	71.7 1.1
May 1	48.09 0.29	82.5 1.3	18.16 0.34	81.8 1.4	51.82 0.12	72.8 1.0
11	47.80 0.30	83.8 0.8	17.82 0.36	83.2 0.9	51.70 0.13	73.8 0.9
21	47.50 0.31	84.6 0.4	17.46 0.36	84.1 0.4	51.57 0.13	74.7 0.8
31	47.19 0.32	85.0 0.2	17.10 0.35	84.5 0.1	51.44 0.12	75.5 0.6
June 10	46.87 0.30	84.8 0.6	16.75 0.33	84.4 0.5	51.32 0.11	76.1 0.4
20	46.57 0.28	84.2 1.1	16.42 0.30	83.9 1.0	51.21 0.11	76.5 0.2
30	46.29 0.26	83.1 1.6	16.12 0.26	82.9 1.5	51.10 0.09	76.7 0.0
July 10	46.03 0.22	81.5 2.0	15.86 0.22	81.4 1.9	51.01 0.08	76.7 0.1
20	45.81 0.18	79.5 2.3	15.64 0.17	79.5 2.2	50.93 0.06	76.6 0.4
30	45.63 0.14	77.2 2.6	15.47 0.13	77.3 2.5	50.87 0.04	76.2 0.6
Aug. 9	45.49 0.08	74.6 2.7	15.34 0.06	74.8 2.8	50.83 0.01	75.6 0.7
19	45.41 0.01	71.9 2.9	15.28 0.01	72.0 3.0	50.82 0.01	74.9 0.9
29	45.40 0.06	69.0 2.9	15.27 0.07	69.0 3.1	50.83 0.04	74.0 1.2
Sept. 8	45.46 0.13	66.1 2.7	15.34 0.13	65.9 3.3	50.87 0.08	72.8 1.4
18	45.59 0.20	63.4 2.4	15.47 0.19	62.6 3.4	50.95 0.12	71.4 1.6
28	45.79 0.28	61.0 2.1	15.66 0.27	59.2 3.3	51.07 0.15	69.8 1.8
Oct. 8	46.07 0.34	58.9 1.6	15.93 0.33	55.9 3.2	51.22 0.19	68.0 2.0
18	46.41 0.41	57.3 1.2	16.26 0.40	52.7 3.0	51.41 0.23	66.0 2.1
28	46.82 0.46	56.1 0.6	16.66 0.45	49.7 2.7	51.64 0.26	63.9 2.2
Nov. 7	47.28 0.49	55.5 0.0	17.11 0.52	47.0 2.5	51.90 0.29	61.7 2.2
17	47.77 0.53	55.5 0.7	17.63 0.57	44.5 2.1	52.19 0.32	59.5 2.2
27	48.30 0.53	56.2 1.3	18.20 0.58	42.4 1.6	52.51 0.34	57.3 2.1
Dec. 7	48.83 0.53	57.5 1.9	18.78 0.59	40.8 1.0	52.85 0.35	55.2 1.9
17	49.36 0.49	59.4 2.5	19.37 0.58	39.8 0.6	53.20 0.34	53.3 1.8
27	49.85 0.34	61.9 2.8	19.95 0.55	39.2 0.1	53.54 0.32	51.5 1.5
37	50.29	64.7	20.50	39.3	53.86	50.0

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sideral Day of the Month.	δ Hydre et Crateris.		β LEONIS.		γ URSE MAJORIS.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 11 ^m 12	[°] 14 ['] 2	^h 11 ^m 42	[°] 15 ['] 19	^h 11 ^m 46	[°] 54 ['] 26
Jan. 1	31.18 0.30	20.1 2.5	5.53 0.32	62.2 1.7	37.95 0.48	58.7 0.5
11	31.48 0.27	22.6 2.4	5.85 0.30	60.5 1.4	38.43 0.44	58.2 0.1
21	31.75 0.24	25.0 2.3	6.15 0.26	59.1 1.1	38.87 0.39	58.3 0.6
31	31.99 0.19	27.3 2.2	6.41 0.21	58.0 0.7	39.26 0.34	58.9 1.2
Feb. 10	32.18 0.15	29.5 2.0	6.62 0.18	57.3 0.4	39.60 0.26	60.1 1.6
20	32.33 0.10	31.5 1.7	6.80 0.14	56.9 0.1	39.86 0.19	61.7 2.0
March 2	32.43 0.05	33.2 1.5	6.94 0.09	56.8 0.3	40.05 0.12	63.7 2.3
12	32.48 0.02	34.7 1.3	7.03 0.04	57.1 0.5	40.17 0.05	66.0 2.4
22	32.50 0.01	36.0 1.0	7.07 0.01	57.6 0.7	40.22 0.03	68.4 2.6
April 1	32.49 0.04	37.0 0.8	7.08 0.03	58.3 0.9	40.19 0.09	71.0 2.5
11	32.45 0.08	37.8 0.5	7.05 0.05	59.2 0.9	40.10 0.14	73.5 2.4
21	32.37 0.10	38.3 0.3	7.00 0.08	60.1 1.0	39.96 0.18	75.9 2.2
May 1	32.27 0.11	38.6 0.1	6.92 0.10	61.1 1.0	39.78 0.21	78.1 1.9
11	32.16 0.11	38.7 0.2	6.82 0.11	62.1 0.9	39.57 0.24	80.0 1.5
21	32.05 0.11	38.5 0.4	6.71 0.11	63.0 0.9	39.33 0.26	81.5 1.1
31	31.94 0.12	38.1 0.5	6.60 0.12	63.9 0.7	39.07 0.26	82.6 0.6
June 10	31.82 0.11	37.6 0.7	6.48 0.11	64.6 0.6	38.81 0.26	83.2 0.2
20	31.71 0.10	36.9 0.8	6.37 0.10	65.2 0.5	38.55 0.26	83.4 0.2
30	31.61 0.09	36.1 1.0	6.27 0.10	65.7 0.3	38.29 0.24	83.2 0.7
July 10	31.52 0.08	35.1 1.1	6.17 0.09	66.0 0.2	38.05 0.21	82.5 1.1
20	31.44 0.07	34.0 1.1	6.08 0.08	66.2 0.0	37.84 0.19	81.4 1.4
30	31.37 0.05	32.9 1.1	6.00 0.07	66.2 0.1	37.65 0.16	80.0 1.9
Aug. 9	31.32 0.02	31.8 1.1	5.93 0.05	66.1 0.4	37.49 0.12	78.1 2.3
19	31.30 0.00	30.7 1.1	5.88 0.02	65.7 0.6	37.37 0.08	75.8 2.5
29	31.30 0.03	29.6 0.9	5.86 0.01	65.1 0.8	37.29 0.03	73.3 2.7
Sept. 8	31.33 0.07	28.7 0.7	5.87 0.03	64.3 1.1	37.26 0.01	70.6 3.0
18	31.40 0.11	28.0 0.4	5.90 0.07	63.2 1.3	37.27 0.08	67.6 3.3
28	31.51 0.15	27.6 0.2	5.97 0.11	61.9 1.5	37.35 0.13	64.3 3.4
Oct. 8	31.66 0.18	27.4 0.2	6.08 0.15	60.4 1.7	37.48 0.19	60.9 3.3
18	31.84 0.21	27.6 0.4	6.23 0.20	58.7 1.9	37.67 0.26	57.6 3.3
28	32.05 0.25	28.0 0.9	6.43 0.23	56.8 2.1	37.93 0.32	54.3 3.1
Nov. 7	32.30 0.29	28.9 1.2	6.66 0.26	54.7 2.2	38.25 0.36	51.2 2.9
17	32.59 0.32	30.1 1.6	6.92 0.29	52.5 2.2	38.61 0.41	48.3 2.7
27	32.91 0.33	31.7 1.8	7.21 0.31	50.3 2.2	39.02 0.46	45.6 2.4
Dec. 7	33.24 0.33	33.5 2.1	7.52 0.33	48.1 2.1	39.48 0.47	43.2 1.9
17	33.57 0.33	35.6 2.2	7.85 0.34	46.0 2.0	39.95 0.48	41.3 1.3
27	33.90 0.31	37.8 2.4	8.19 0.32	44.0 1.9	40.43 0.47	40.0 0.7
37	34.21	40.2	8.51	42.1	40.90	39.3

after the 22d of March it begins at the Sideral Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β Chamæleontis.		α^1 Crucis.		β Corvi.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 12 ^m 10	[°] 78 ['] 32	^h 12 ^m 19	[°] 62 ['] 20	^h 12 ^m 27	[°] 22 ['] 38
Jan. 1	25.68 1.21	53.0 1.8	1.67 0.58	9.1 2.1	12.87 0.35	19.6 2.3
11	26.89 1.10	54.8 2.4	2.25 0.54	11.2 2.5	13.22 0.33	21.9 2.3
21	27.99 0.97	57.2 2.8	2.79 0.49	13.7 2.8	13.55 0.30	24.2 2.4
31	28.96 0.84	60.0 3.2	3.28 0.42	16.5 3.1	13.85 0.27	26.6 2.3
Feb. 10	29.80 0.69	63.2 3.5	3.70 0.35	19.6 3.4	14.12 0.22	28.9 2.3
20	30.49 0.51	66.7 3.8	4.05 0.28	23.0 3.5	14.34 0.17	31.2 2.1
March 2	31.00 0.35	70.5 3.8	4.33 0.21	26.5 3.5	14.51 0.14	33.3 2.0
12	31.35 0.19	74.3 3.8	4.54 0.13	30.0 3.5	14.65 0.10	35.3 1.8
22	31.54 0.01	78.1 3.7	4.67 0.06	33.5 3.4	14.75 0.06	37.1 1.5
April 1	31.55 0.14	81.8 3.6	4.73 0.01	36.9 3.2	14.81 0.02	38.6 1.3
11	31.41 0.29	85.4 3.4	4.72 0.07	40.1 3.0	14.83 0.00	39.9 1.1
21	31.12 0.44	88.8 3.1	4.65 0.13	43.1 2.6	14.83 0.03	41.0 0.8
May 1	30.68 0.56	91.9 2.8	4.52 0.18	45.7 2.3	14.80 0.05	41.8 0.6
11	30.12 0.65	94.7 2.3	4.34 0.22	48.0 1.9	14.75 0.08	42.4 0.4
21	29.47 0.75	97.0 1.9	4.12 0.25	49.9 1.5	14.67 0.09	42.8 0.1
31	28.72 0.83	98.9 1.4	3.87 0.29	51.4 1.0	14.56 0.10	42.9 0.1
June 10	27.89 0.89	100.3 0.9	3.58 0.32	52.4 0.6	14.48 0.11	42.8 0.3
20	27.00 0.91	101.2 0.3	3.26 0.33	53.0 0.1	14.37 0.11	42.5 0.5
30	26.09 0.92	101.5 0.2	2.93 0.34	53.1 0.4	14.26 0.12	42.0 0.7
July 10	25.17 0.89	101.3 0.8	2.59 0.33	52.7 0.9	14.14 0.12	41.3 0.9
20	24.28 0.84	100.5 1.2	2.26 0.31	51.8 1.3	14.02 0.12	40.4 1.0
30	23.44 0.75	99.3 1.8	1.95 0.28	50.5 1.8	13.90 0.11	39.4 1.2
Aug. 9	22.69 0.65	97.5 2.3	1.67 0.25	48.7 2.2	13.79 0.09	38.2 1.2
19	22.04 0.51	95.2 2.5	1.42 0.20	46.5 2.4	13.70 0.07	37.0 1.3
29	21.53 0.34	92.7 2.8	1.22 0.14	44.1 2.6	13.63 0.04	35.7 1.2
Sept. 8	21.19 0.16	89.9 3.0	1.06 0.05	41.5 2.8	13.59 0.01	34.5 1.1
18	21.03 0.04	86.9 3.1	1.03 0.03	38.7 2.7	13.58 0.03	33.4 1.1
28	21.07 0.25	83.8 3.0	1.06 0.13	36.0 2.6	13.61 0.06	32.3 0.8
Oct. 8	21.32 0.45	80.8 2.8	1.19 0.21	33.4 2.4	13.67 0.12	31.5 0.5
18	21.77 0.64	78.0 2.6	1.40 0.28	31.0 2.1	13.79 0.17	31.0 0.2
28	22.41 0.83	75.4 2.2	1.68 0.37	28.9 1.7	13.96 0.22	30.8 0.1
Nov. 7	23.24 0.99	73.2 1.6	2.05 0.46	27.2 1.2	14.18 0.25	30.9 0.6
17	24.23 1.11	71.6 1.1	2.51 0.53	26.0 0.7	14.43 0.29	31.5 0.9
27	25.34 1.19	70.5 0.5	3.04 0.56	25.3 0.0	14.72 0.32	32.4 1.3
Dec. 7	26.53 1.25	70.0 0.2	3.60 0.59	25.8 0.5	15.04 0.23	33.7 1.6
17	27.78 1.26	70.2 0.9	4.19 0.59	25.8 1.2	15.37 0.35	35.3 1.9
27	29.04 1.21	71.1 1.5	4.78 0.58	27.0 1.7	15.72 0.34	37.2 2.1
37	30.25	72.6	5.36	28.7	16.06	39.3

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	12 Canum Venaticorum.		α VIRGINIS. (Spica.)		γ URSE MAJORIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h ^m 12 49	[°] ['] 39 2	^h ^m 13 17	[°] ['] 10 26	^h ^m 13 42	[°] ['] 49 59
Jan. 1	37.57 0.39	71.9 1.6	59.62 0.34	47.1 2.0	8.36 0.43	31.7 1.9
11	37.96 0.38	70.3 1.0	59.96 0.33	49.1 2.0	8.79 0.44	29.8 1.3
21	38.34 0.35	69.3 0.5	60.29 0.31	51.1 1.9	9.23 0.42	28.5 0.7
31	38.69 0.32	68.8 0.0	60.60 0.29	53.0 1.8	9.65 0.40	27.8 0.1
Feb. 10	39.01 0.27	68.8 0.5	60.89 0.25	54.8 1.6	10.05 0.36	27.7 0.6
20	39.28 0.22	69.3 1.0	61.14 0.21	56.4 1.5	10.41 0.32	28.3 1.1
March 2	39.50 0.18	70.3 1.4	61.35 0.18	57.9 1.3	10.78 0.27	29.4 1.6
12	39.68 0.12	71.7 1.8	61.53 0.15	59.2 1.1	11.00 0.21	31.0 2.0
22	39.80 0.08	73.5 2.0	61.68 0.11	60.3 0.8	11.21 0.15	33.0 2.4
April 1	39.88 0.03	75.5 2.2	61.79 0.08	61.1 0.5	11.36 0.09	35.4 2.6
11	39.91 0.02	77.7 2.3	61.87 0.05	61.6 0.2	11.45 0.04	38.0 2.7
21	39.89 0.06	80.0 2.2	61.92 0.02	61.8 0.1	11.49 0.02	40.7 2.8
May 1	39.83 0.09	82.2 2.1	61.94 0.00	61.9 0.0	11.47 0.07	43.5 2.7
11	39.74 0.11	84.3 1.9	61.94 0.03	61.9 0.2	11.40 0.11	46.2 2.5
21	39.63 0.13	86.2 1.6	61.91 0.06	61.7 0.3	11.29 0.14	48.7 2.3
31	39.50 0.15	87.8 1.4	61.85 0.07	61.4 0.4	11.15 0.17	51.0 1.9
June 10	39.35 0.17	89.2 1.0	61.78 0.08	61.0 0.5	10.96 0.19	52.9 1.5
20	39.18 0.17	90.2 0.7	61.70 0.09	60.5 0.5	10.79 0.23	54.4 1.1
30	39.01 0.17	90.9 0.3	61.61 0.11	60.0 0.6	10.56 0.25	55.5 0.7
July 10	38.84 0.17	91.2 0.1	61.50 0.11	59.4 0.7	10.31 0.25	56.2 0.2
20	38.67 0.17	91.1 0.6	61.39 0.12	58.7 0.7	10.06 0.25	56.4 0.2
30	38.50 0.16	90.5 0.9	61.27 0.12	58.0 0.7	9.81 0.25	56.2 0.5
Aug. 9	38.34 0.14	89.6 1.2	61.15 0.11	57.3 0.7	9.56 0.24	55.7 1.1
19	38.20 0.12	88.4 1.4	61.04 0.11	56.6 0.6	9.32 0.22	54.6 1.6
29	38.08 0.09	87.0 1.9	60.93 0.08	56.0 0.5	9.10 0.19	53.0 1.9
Sept. 8	37.99 0.05	85.1 2.3	60.85 0.05	55.5 0.5	8.91 0.16	51.1 2.4
18	37.94 0.02	82.8 2.5	60.80 0.02	55.0 0.3	8.75 0.12	48.7 2.7
28	37.92 0.02	80.3 2.7	60.78 0.01	54.7 0.1	8.63 0.08	46.0 3.0
Oct. 8	37.94 0.07	77.6 2.8	60.79 0.06	54.6 0.2	8.55 0.01	43.0 3.2
18	38.01 0.13	74.8 3.0	60.85 0.11	54.8 0.3	8.54 0.04	39.8 3.4
28	38.14 0.19	71.8 3.1	60.96 0.15	55.1 0.7	8.58 0.11	36.4 3.5
Nov. 7	38.33 0.23	68.7 3.1	61.11 0.20	55.8 1.0	8.69 0.17	32.9 3.5
17	38.56 0.27	65.6 3.1	61.31 0.25	56.8 1.2	8.86 0.25	29.4 3.5
27	38.83 0.32	62.5 2.9	61.56 0.28	58.0 1.5	9.11 0.30	25.9 3.3
Dec. 7	39.15 0.35	59.6 2.5	61.84 0.30	59.5 1.7	9.41 0.35	22.6 2.9
17	39.50 0.37	57.1 2.1	62.14 0.32	61.2 1.9	9.76 0.39	19.7 2.6
27	39.87 0.38	55.0 1.8	62.46 0.34	63.1 2.0	10.15 0.41	17.1 2.1
37	40.25	53.2	62.80	65.1	10.56	15.0

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ Bootis.		β Centauri.		α Bootis. (Arcturus.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 13 ^m 48	[°] 19 ['] 4	^h 13 ^m 54	[°] 59 ['] 42	^h 14 ^m 9	[°] 19 ['] 53
Jan. 1	10.26 ^s 0.33	56.3 ["] 2.2	12.04 ^s 0.59	24.9 ["] 0.8	25.15 ^s 0.33	37.7 ["] 2.3
11	10.59 0.33	54.1 1.8	12.63 0.58	25.7 1.2	25.48 0.33	35.4 1.9
21	10.92 0.32	52.3 1.4	13.21 0.55	26.9 1.7	25.81 0.32	33.5 1.5
31	11.24 0.30	50.9 1.0	13.76 0.52	28.6 2.1	26.13 0.31	32.0 1.1
Feb. 10	11.54 0.28	49.9 0.6	14.28 0.49	30.7 2.4	26.44 0.28	30.9 0.7
20	11.82 0.23	49.3 0.2	14.77 0.43	33.1 2.6	26.72 0.25	30.2 0.3
March 2	12.05 0.21	49.1 0.3	15.20 0.37	35.7 2.8	26.97 0.23	29.9 0.2
12	12.26 0.18	49.4 0.6	15.57 0.32	38.5 3.0	27.20 0.20	30.1 0.6
22	12.44 0.13	50.0 1.0	15.89 0.27	41.5 3.0	27.40 0.15	30.7 0.9
April 1	12.57 0.10	51.0 1.2	16.16 0.20	44.5 3.0	27.55 0.12	31.6 1.2
11	12.67 0.07	52.2 1.4	16.36 0.14	47.5 2.9	27.67 0.08	32.8 1.5
21	12.74 0.03	53.6 1.6	16.50 0.07	50.4 2.7	27.75 0.05	34.3 1.6
May 1	12.77 0.00	55.2 1.6	16.57 0.02	53.1 2.6	27.80 0.02	35.9 1.7
11	12.77 0.02	56.8 1.6	16.59 0.03	55.7 2.4	27.82 0.01	37.6 1.7
21	12.75 0.05	58.4 1.6	16.56 0.09	58.1 2.1	27.81 0.04	39.3 1.6
31	12.70 0.07	60.0 1.4	16.47 0.14	60.2 1.8	27.77 0.06	40.9 1.5
June 10	12.63 0.09	61.4 1.3	16.33 0.18	62.0 1.3	27.71 0.08	42.4 1.4
20	12.54 0.10	62.7 1.0	16.15 0.23	63.3 1.0	27.63 0.10	43.8 1.1
30	12.44 0.12	63.7 0.9	15.92 0.27	64.3 0.6	27.53 0.12	44.9 0.9
July 10	12.32 0.14	64.6 0.6	15.65 0.29	64.9 0.1	27.41 0.13	45.8 0.7
20	12.18 0.14	65.2 0.3	15.36 0.30	65.0 0.3	27.28 0.15	46.5 0.5
30	12.04 0.14	65.5 0.1	15.06 0.31	64.7 0.8	27.13 0.15	47.0 0.1
Aug. 9	11.90 0.14	65.6 0.2	14.75 0.31	63.9 1.2	26.98 0.15	47.1 0.1
19	11.76 0.13	65.4 0.4	14.44 0.29	62.7 1.5	26.83 0.15	47.0 0.4
29	11.63 0.11	65.0 0.7	14.15 0.25	61.2 1.9	26.68 0.14	46.6 0.7
Sept. 8	11.52 0.09	64.3 1.0	13.90 0.20	59.3 2.2	26.54 0.11	45.9 1.0
18	11.43 0.06	63.3 1.3	13.70 0.15	57.1 2.4	26.43 0.08	44.9 1.3
28	11.37 0.03	62.0 1.6	13.55 0.07	54.7 2.5	26.35 0.05	43.6 1.6
Oct. 8	11.34 0.01	60.4 1.9	13.48 0.02	52.2 2.5	26.30 0.01	42.0 1.9
18	11.35 0.06	58.5 2.1	13.50 0.11	49.7 2.4	26.29 0.03	40.1 2.2
28	11.41 0.11	56.4 2.3	13.61 0.21	47.3 2.2	26.32 0.08	37.9 2.4
Nov. 7	11.52 0.16	54.1 2.4	13.82 0.29	45.1 1.9	26.40 0.14	35.5 2.6
17	11.68 0.21	51.7 2.6	14.11 0.37	43.2 1.5	26.54 0.18	32.9 2.6
27	11.89 0.24	49.1 2.6	14.48 0.43	41.7 1.0	26.72 0.23	30.3 2.6
Dec. 7	12.13 0.28	46.5 2.6	14.91 0.50	40.7 0.5	26.95 0.26	27.7 2.7
17	12.41 0.31	43.9 2.4	15.41 0.53	40.2 0.0	27.21 0.29	25.0 2.5
27	12.72 0.32	41.5 2.2	15.94 0.56	40.2 0.5	27.50 0.31	22.5 2.3
37	13.04	39.3	16.50	40.7	27.81	20.2

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sideral Day of the Month.	α Centauri.		β Bootis.		γ Libræ.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h 14 ^m 30	[°] 60 ['] 15	^h 14 ^m 39	[°] 27 ['] 38	^h 14 ^m 43	[°] 15 ['] 28
Jan. 1	20.65 0.57	42.8 0.2	0.27 0.33	59.1 2.3	18.70 0.33	13.4 1.5
11	21.22 0.57	43.0 0.7	0.60 0.33	56.8 2.0	19.03 0.34	14.9 1.6
21	21.79 0.57	43.7 1.2	0.93 0.34	54.8 1.6	19.37 0.33	16.5 1.6
31	22.36 0.55	44.9 1.6	1.27 0.33	53.2 1.1	19.70 0.32	18.1 1.6
Feb. 10	22.91 0.52	46.5 1.9	1.60 0.31	52.1 0.6	20.02 0.30	19.7 1.5
20	23.43 0.48	48.4 2.2	1.91 0.29	51.5 0.0	20.32 0.28	21.2 1.3
March 2	23.91 0.43	50.6 2.4	2.20 0.26	51.5 0.5	20.60 0.26	22.5 1.1
12	24.34 0.37	53.0 2.6	2.46 0.22	52.0 0.9	20.86 0.23	23.6 1.0
22	24.71 0.32	55.6 2.7	2.68 0.19	52.9 1.3	21.09 0.20	24.6 0.8
April 1	25.03 0.27	58.3 2.8	2.87 0.15	54.2 1.7	21.29 0.17	25.4 0.7
11	25.30 0.20	61.1 2.8	3.02 0.12	55.9 1.9	21.46 0.14	26.1 0.4
21	25.50 0.15	63.9 2.7	3.14 0.08	57.8 2.0	21.60 0.10	26.5 0.3
May 1	25.65 0.09	66.6 2.6	3.22 0.04	59.8 2.1	21.70 0.08	26.8 0.1
11	25.74 0.03	69.2 2.4	3.26 0.01	61.9 2.2	21.78 0.05	26.9 0.0
21	25.77 0.04	71.6 2.2	3.27 0.02	64.1 2.2	21.83 0.02	26.9 0.0
31	25.73 0.10	73.8 2.0	3.25 0.05	66.3 2.0	21.85 0.00	26.9 0.1
June 10	25.63 0.15	75.8 1.6	3.20 0.08	68.3 1.8	21.85 0.03	26.8 0.2
20	25.48 0.21	77.4 1.3	3.12 0.10	70.1 1.4	21.82 0.06	26.6 0.4
30	25.27 0.25	78.7 0.9	3.02 0.13	71.5 1.2	21.76 0.09	26.2 0.4
July 10	25.02 0.29	79.6 0.5	2.89 0.14	72.7 1.0	21.67 0.11	25.8 0.5
20	24.73 0.32	80.1 0.0	2.75 0.16	73.7 0.6	21.56 0.12	25.3 0.5
30	24.41 0.33	80.1 0.4	2.59 0.17	74.3 0.3	21.44 0.14	24.8 0.6
Aug. 9	24.08 0.34	79.7 0.8	2.42 0.18	74.6 0.0	21.30 0.15	24.2 0.6
19	23.74 0.33	78.9 1.2	2.24 0.18	74.6 0.4	21.15 0.15	23.6 0.6
29	23.41 0.31	77.7 1.6	2.06 0.16	74.2 0.8	21.00 0.14	23.0 0.6
Sept. 8	23.10 0.27	76.1 1.9	1.90 0.15	73.4 1.1	20.86 0.12	22.4 0.5
18	22.83 0.22	74.2 2.2	1.75 0.13	72.3 1.4	20.74 0.10	21.9 0.5
28	22.61 0.16	72.0 2.4	1.62 0.09	70.9 1.8	20.64 0.07	21.4 0.4
Oct. 8	22.45 0.06	69.6 2.4	1.53 0.05	69.1 2.1	20.57 0.02	21.0 0.3
18	22.39 0.04	67.2 2.5	1.48 0.00	67.0 2.4	20.55 0.02	20.7 0.0
28	22.43 0.12	64.7 2.3	1.48 0.04	64.6 2.5	20.57 0.07	20.7 0.2
Nov. 7	22.55 0.21	62.4 2.1	1.52 0.10	62.1 2.8	20.64 0.13	20.9 0.4
17	22.76 0.30	60.3 1.8	1.62 0.16	59.3 2.9	20.77 0.17	21.3 0.7
27	23.06 0.37	58.5 1.5	1.78 0.21	56.4 3.0	20.94 0.22	22.0 0.9
Dec. 7	23.43 0.45	57.0 1.0	1.99 0.25	53.4 2.9	21.16 0.26	22.9 1.1
17	23.88 0.51	56.0 0.6	2.24 0.27	50.5 2.7	21.42 0.29	24.0 1.3
27	24.39 0.55	55.4 0.0	2.51 0.31	47.8 2.5	21.71 0.31	25.3 1.5
37	24.94	55.4	2.82	45.3	22.02	26.8

after the 22d of March it begins at the Sideral 0h. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	β URSE MINORIS.		β LIBRÆ.		α CORONÆ BOREALIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 14 ^m 51	[°] 74 ['] 42	^h 15 ^m 9	[°] 8 ['] 52	^h 15 ^m 28	[°] 27 ['] 10
Jan. 1	5.08 0.78	34.2 2.3	38.58 0.32	31.5 1.6	53.07 0.30	29.7 2.6
11	5.86 0.83	31.9 1.7	38.90 0.32	33.1 1.6	53.37 0.32	27.1 2.2
21	6.69 0.86	30.2 1.0	39.22 0.32	34.7 1.6	53.69 0.32	24.9 1.8
31	7.55 0.89	29.2 0.3	39.54 0.31	36.3 1.4	54.01 0.33	23.1 1.3
Feb. 10	8.44 0.86	28.9 0.3	39.85 0.30	37.7 1.3	54.34 0.32	21.8 0.8
20	9.30 0.80	29.2 1.0	40.15 0.29	39.0 1.0	54.66 0.31	21.0 0.3
March 2	10.10 0.72	30.2 1.6	40.44 0.27	40.0 0.8	54.97 0.27	20.7 0.2
12	10.82 0.62	31.8 2.1	40.71 0.24	40.8 0.6	55.24 0.26	20.9 0.7
22	11.44 0.50	33.9 2.6	40.95 0.21	41.4 0.5	55.50 0.24	21.6 1.1
April 1	11.94 0.37	36.5 3.0	41.16 0.19	41.9 0.2	55.74 0.20	22.7 1.5
11	12.31 0.22	39.5 3.2	41.35 0.16	42.1 0.0	55.94 0.17	24.2 1.9
21	12.53 0.07	42.7 3.3	41.51 0.12	42.1 0.2	56.11 0.13	26.1 2.1
May 1	12.60 0.07	46.0 3.3	41.63 0.10	41.9 0.3	56.24 0.10	28.2 2.3
11	12.53 0.20	49.3 3.1	41.73 0.08	41.6 0.4	56.34 0.07	30.5 2.3
21	12.33 0.33	52.4 2.8	41.81 0.04	41.2 0.6	56.41 0.02	32.8 2.3
31	12.00 0.45	55.2 2.5	41.85 0.01	40.6 0.5	56.43 0.01	35.1 2.2
June 10	11.55 0.55	57.7 2.2	41.86 0.01	40.1 0.5	56.42 0.04	37.3 2.1
20	11.00 0.63	59.9 1.8	41.85 0.04	39.6 0.6	56.38 0.07	39.4 1.9
30	10.37 0.70	61.7 1.3	41.81 0.07	39.0 0.6	56.31 0.10	41.3 1.6
July 10	9.67 0.75	63.0 0.8	41.74 0.10	38.4 0.6	56.21 0.13	42.9 1.3
20	8.92 0.80	63.8 0.2	41.64 0.12	37.8 0.6	56.08 0.16	44.2 1.1
30	8.12 0.81	64.0 0.3	41.52 0.14	37.2 0.5	55.92 0.17	45.3 0.7
Aug. 9	7.31 0.80	63.7 0.8	41.38 0.15	36.7 0.5	55.75 0.18	46.0 0.3
19	6.51 0.80	62.9 1.3	41.23 0.15	36.2 0.5	55.57 0.19	46.3 0.1
29	5.71 0.75	61.6 1.8	41.08 0.15	35.7 0.4	55.38 0.19	46.2 0.4
Sept. 8	4.96 0.69	59.8 2.3	40.93 0.13	35.3 0.2	55.19 0.18	45.8 0.7
18	4.27 0.61	57.5 2.7	40.80 0.11	35.1 0.2	55.01 0.17	45.1 1.1
28	3.66 0.52	54.8 3.0	40.69 0.09	34.9 0.0	54.84 0.14	44.0 1.5
Oct. 8	3.14 0.41	51.8 3.3	40.60 0.05	34.9 0.1	54.70 0.10	42.5 1.8
18	2.73 0.28	48.5 3.6	40.55 0.01	35.0 0.3	54.60 0.06	40.7 2.2
28	2.45 0.14	44.9 3.8	40.54 0.04	35.3 0.5	54.54 0.01	38.5 2.5
Nov. 7	2.31 0.01	41.1 3.7	40.58 0.10	35.8 0.8	54.53 0.05	36.0 2.6
17	2.32 0.18	37.4 3.8	40.68 0.14	36.6 1.0	54.58 0.10	33.4 2.8
27	2.50 0.33	33.6 3.6	40.82 0.19	37.6 1.2	54.68 0.15	30.6 2.9
Dec. 7	2.83 0.47	30.0 3.3	41.01 0.22	38.8 1.3	54.83 0.20	27.7 2.9
17	3.30 0.60	26.7 3.0	41.23 0.27	40.1 1.4	55.03 0.24	24.8 2.9
27	3.90 0.70	23.7 2.6	41.50 0.29	41.5 1.6	55.27 0.28	21.9 2.7
37	4.60	21.1	41.79	43.1	55.55	19.2

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α SERPENTIS.		ζ URSAE MINORIS.		β^1 SCORPII.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h ^m 15 37	[°] ['] 6 51	^h ^m 15 48	[°] ['] 78 12	^h ^m 15 57	[°] ['] 19 25
Jan. 1	31.31 0.30	26.7 2.1	55.38 0.78	36.1 2.7	28.65 0.30	37.1 0.9
11	31.61 0.30	24.6 1.9	56.16 0.91	33.4 2.3	28.95 0.32	38.0 1.1
21	31.91 0.30	22.7 1.6	57.07 1.02	31.1 1.7	29.27 0.33	39.1 1.1
31	32.21 0.30	21.1 1.3	58.09 1.08	29.4 1.0	29.60 0.33	40.2 1.1
Feb. 10	32.51 0.30	19.8 1.1	59.17 1.12	28.4 0.4	29.93 0.33	41.3 1.0
20	32.81 0.30	18.7 0.8	60.29 1.08	28.0 0.3	30.26 0.32	42.3 1.0
March 2	33.11 0.27	17.9 0.4	61.37 1.01	28.3 1.0	30.58 0.30	43.3 0.8
12	33.38 0.25	17.5 0.0	62.38 0.94	29.3 1.6	30.88 0.27	44.1 0.8
22	33.63 0.22	17.5 0.4	63.32 0.83	30.9 2.1	31.15 0.26	44.9 0.6
April 1	33.85 0.20	17.9 0.6	64.15 0.68	33.0 2.6	31.41 0.24	45.5 0.5
11	34.05 0.17	18.5 0.9	64.83 0.52	35.6 2.9	31.65 0.21	46.0 0.4
21	34.22 0.15	19.4 1.2	65.35 0.33	38.5 3.1	31.86 0.19	46.4 0.2
May 1	34.37 0.12	20.6 1.3	65.68 0.15	41.6 3.3	32.05 0.16	46.6 0.2
11	34.49 0.09	21.9 1.4	65.83 0.04	44.9 3.3	32.21 0.13	46.8 0.1
21	34.58 0.06	23.3 1.4	65.79 0.22	48.2 3.2	32.34 0.09	46.9 0.1
31	34.64 0.02	24.7 1.4	65.57 0.40	51.4 3.0	32.48 0.06	47.0 0.0
June 10	34.66 0.00	26.1 1.4	65.17 0.56	54.4 2.7	32.49 0.03	47.0 0.1
20	34.66 0.03	27.5 1.2	64.61 0.70	57.1 2.4	32.52 0.01	46.9 0.2
30	34.63 0.06	28.7 1.2	63.91 0.83	59.5 2.0	32.51 0.05	46.7 0.2
July 10	34.57 0.09	29.9 1.0	63.08 0.92	61.5 1.5	32.46 0.08	46.5 0.2
20	34.48 0.12	30.9 0.8	62.16 1.01	63.0 1.0	32.38 0.10	46.3 0.3
30	34.36 0.14	31.7 0.7	61.15 1.08	64.0 0.5	32.28 0.13	46.0 0.3
Aug. 9	34.22 0.16	32.4 0.5	60.07 1.11	64.5 0.1	32.15 0.15	45.7 0.4
19	34.06 0.16	32.9 0.3	58.96 1.13	64.6 0.5	32.00 0.17	45.3 0.4
29	33.90 0.16	33.2 0.0	57.83 1.11	64.1 1.0	31.83 0.17	44.9 0.4
Sept. 8	33.74 0.15	33.2 0.2	56.72 1.08	63.1 1.5	31.66 0.16	44.5 0.5
18	33.59 0.14	33.0 0.4	55.64 1.01	61.6 2.0	31.50 0.15	44.0 0.5
28	33.45 0.12	32.6 0.6	54.63 0.91	59.6 2.4	31.35 0.13	43.5 0.4
Oct. 8	33.33 0.08	32.0 0.9	53.72 0.80	57.2 2.8	31.22 0.09	43.1 0.4
18	33.25 0.03	31.1 1.1	52.92 0.66	54.4 3.2	31.13 0.04	42.7 0.3
28	33.22 0.01	30.0 1.3	52.26 0.50	51.2 3.4	31.09 0.00	42.4 0.2
Nov. 7	33.23 0.05	28.7 1.6	51.76 0.29	47.8 3.6	31.09 0.04	42.2 0.0
17	33.28 0.10	27.1 1.9	51.47 0.09	44.2 3.7	31.13 0.11	42.2 0.2
27	33.38 0.15	25.2 2.0	51.38 0.11	40.5 3.6	31.24 0.16	42.4 0.4
Dec. 7	33.53 0.20	23.2 2.0	51.49 0.31	36.9 3.5	31.40 0.19	42.8 0.5
17	33.73 0.23	21.2 2.1	51.80 0.51	33.4 3.4	31.59 0.24	43.3 0.7
27	33.96 0.25	19.1 2.1	52.31 0.68	30.0 3.0	31.83 0.28	44.0 0.8
37	34.21	17.0	52.99	27.0	32.11	44.8

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	δ OPHIUCHI.			α SCORPII. (Antares.)			γ Draconis.	
	Right Ascension.	Dec. South.		Right Ascension.	Dec. South.		Right Ascension.	Dec. North.
	^h 16	^m 7	[°] 3 20'	^h 16	^m 21	[°] 26 7'	^h 16	^m 22 61° 49'
Jan. 1	10.09 0.27	21.1 1.6		0.77 0.30	26.1 0.6		6.79 0.35	19.1 3.2
11	10.36 0.30	22.7 1.5		1.07 0.32	26.7 0.6		7.14 0.41	15.9 2.7
21	10.66 0.31	24.2 1.4		1.39 0.33	27.3 0.7		7.55 0.47	13.2 2.1
31	10.97 0.30	25.6 1.3		1.72 0.34	28.0 0.8		8.02 0.50	11.1 1.6
Feb. 10	11.27 0.31	26.9 1.1		2.06 0.35	28.8 0.8		8.52 0.51	9.5 1.0
20	11.58 0.30	28.0 0.9		2.41 0.34	29.6 0.8		9.03 0.52	8.5 0.3
March 2	11.88 0.28	28.9 0.5		2.75 0.33	30.4 0.8		9.55 0.50	8.2 0.4
12	12.16 0.27	29.4 0.5		3.08 0.31	31.2 0.7		10.05 0.47	8.6 1.0
22	12.43 0.25	29.9 0.2		3.39 0.28	31.9 0.7		10.52 0.44	9.6 1.6
April 1	12.68 0.23	29.7 0.2		3.67 0.27	32.6 0.6		10.96 0.37	11.2 2.2
11	12.91 0.20	29.5 0.4		3.94 0.24	33.2 0.6		11.33 0.32	13.4 2.6
21	13.11 0.18	29.1 0.7		4.18 0.21	33.8 0.5		11.65 0.26	16.0 3.0
May 1	13.29 0.15	28.4 0.8		4.39 0.18	34.3 0.5		11.91 0.19	19.0 3.2
11	13.44 0.12	27.6 0.8		4.57 0.16	34.8 0.4		12.10 0.11	22.2 3.3
21	13.56 0.09	26.8 1.0		4.73 0.13	35.2 0.3		12.21 0.02	25.5 3.3
31	13.65 0.06	25.8 1.0		4.86 0.09	35.5 0.3		12.23 0.05	28.8 3.2
June 10	13.71 0.03	24.8 1.0		4.95 0.05	35.8 0.3		12.18 0.12	32.0 3.1
20	13.74 0.00	23.8 0.9		5.00 0.02	36.1 0.2		12.06 0.18	35.1 2.8
30	13.74 0.04	22.9 0.8		5.02 0.02	36.3 0.2		11.88 0.25	37.9 2.5
July 10	13.70 0.07	22.1 0.8		5.00 0.07	36.5 0.1		11.63 0.31	40.4 2.1
20	13.63 0.10	21.3 0.7		4.93 0.10	36.6 0.0		11.32 0.36	42.5 1.7
30	13.53 0.13	20.6 0.6		4.83 0.13	36.6 0.1		10.96 0.40	44.2 1.2
Aug. 9	13.40 0.15	20.0 0.5		4.70 0.15	36.5 0.2		10.56 0.43	45.4 0.7
19	13.25 0.16	19.5 0.4		4.55 0.18	36.3 0.3		10.13 0.46	46.1 0.2
29	13.09 0.16	19.1 0.3		4.37 0.18	36.0 0.4		9.67 0.46	46.3 0.4
Sept. 8	12.93 0.16	18.8 0.1		4.19 0.18	35.6 0.5		9.21 0.46	45.9 0.8
18	12.77 0.15	18.7 0.0		4.01 0.17	35.1 0.6		8.75 0.44	45.1 1.4
28	12.62 0.13	18.7 0.2		3.84 0.15	34.5 0.7		8.31 0.40	43.7 1.9
Oct. 8	12.49 0.10	18.9 0.4		3.69 0.12	33.8 0.6		7.91 0.35	41.8 2.3
18	12.39 0.06	19.3 0.5		3.57 0.07	33.2 0.6		7.56 0.30	39.5 2.7
28	12.33 0.01	19.8 0.7		3.50 0.02	32.6 0.5		7.26 0.22	36.8 2.9
Nov. 7	12.32 0.03	20.5 0.9		3.48 0.03	32.1 0.4		7.04 0.15	33.9 3.3
17	12.35 0.07	21.4 1.1		3.51 0.08	31.7 0.4		6.89 0.05	30.6 3.7
27	12.42 0.13	22.5 1.3		3.59 0.13	31.3 0.2		6.84 0.05	26.9 3.8
Dec. 7	12.55 0.18	23.8 1.5		3.72 0.19	31.1 0.1		6.89 0.14	23.1 3.7
17	12.73 0.22	25.3 1.5		3.91 0.24	31.2 0.2		7.03 0.22	19.4 3.5
27	12.95 0.25	26.8 1.6		4.15 0.26	31.4 0.4		7.25 0.31	15.9 3.2
37	13.20	28.4		4.41	31.8		7.56	12.7

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Trianguli Australis.		ε Ursæ Minoris.		α HERCULIS.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 16 ^m 34	[°] 68 ['] 45	^h 16 ^m 59	[°] 82 ['] 15	^h 17 ^m 8	[°] 14 ['] 32
Jan. 1	10.79 0.61	62.9 1.7	56.13 0.69	17.6 3.2	23.71 0.22	53.9 2.2
11	11.40 0.68	61.2 1.2	56.82 0.96	14.4 2.8	23.93 0.25	51.7 2.1
21	12.08 0.73	60.0 0.8	57.78 1.21	11.6 2.3	24.18 0.26	49.6 1.9
31	12.81 0.76	59.2 0.4	58.99 1.40	9.3 1.9	24.44 0.28	47.7 1.6
Feb. 10	13.57 0.77	58.8 0.0	60.39 1.54	7.4 1.3	24.72 0.30	46.1 1.2
20	14.34 0.78	58.8 0.4	61.93 1.60	6.1 0.6	25.02 0.29	44.9 0.8
March 2	15.12 0.76	59.2 0.8	63.53 1.62	5.5 0.0	25.31 0.30	44.1 0.3
12	15.88 0.72	60.0 1.1	65.15 1.57	5.5 0.7	25.61 0.27	43.8 0.1
22	16.60 0.69	61.1 1.5	66.72 1.47	6.2 1.4	25.88 0.28	43.9 0.4
April 1	17.29 0.64	62.6 1.8	68.19 1.34	7.6 1.9	26.16 0.26	44.3 0.9
11	17.93 0.58	64.4 2.1	69.53 1.14	9.5 2.4	26.42 0.25	45.2 1.3
21	18.51 0.52	66.5 2.2	70.67 0.90	11.9 2.7	26.67 0.22	46.5 1.6
May 1	19.03 0.43	68.7 2.4	71.57 0.64	14.6 3.0	26.89 0.19	48.1 1.8
11	19.46 0.35	71.1 2.5	72.21 0.37	17.6 3.3	27.08 0.17	49.9 2.0
21	19.81 0.26	73.6 2.5	72.58 0.08	20.9 3.3	27.25 0.14	51.9 2.0
31	20.07 0.17	76.1 2.5	72.66 0.22	24.2 3.2	27.39 0.10	53.9 2.0
June 10	20.24 0.07	78.6 2.5	72.44 0.48	27.4 3.2	27.49 0.07	55.9 2.0
20	20.31 0.03	81.1 2.3	71.96 0.73	30.6 3.0	27.56 0.03	57.9 2.0
30	20.28 0.13	83.4 2.1	71.23 0.98	33.6 2.7	27.59 0.01	59.9 1.8
July 10	20.15 0.23	85.5 1.9	70.25 1.19	36.3 2.4	27.58 0.03	61.7 1.6
20	19.92 0.32	87.4 1.5	69.06 1.37	38.7 2.0	27.53 0.08	63.3 1.5
30	19.60 0.38	88.9 1.1	67.69 1.54	40.7 1.5	27.45 0.12	64.8 1.2
Aug. 9	19.22 0.45	90.0 0.8	66.15 1.66	42.2 1.1	27.33 0.15	66.0 0.9
19	18.77 0.50	90.8 0.3	64.49 1.75	43.3 0.6	27.18 0.17	66.9 0.7
29	18.27 0.50	91.1 0.2	62.74 1.81	43.9 0.1	27.01 0.18	67.6 0.4
Sept. 8	17.77 0.51	90.9 0.7	60.93 1.82	44.0 0.5	26.83 0.18	68.0 0.1
18	17.26 0.49	90.2 1.2	59.11 1.80	43.5 1.0	26.65 0.19	68.1 0.2
28	16.77 0.43	89.0 1.6	57.31 1.71	42.5 1.5	26.46 0.18	67.9 0.5
Oct. 8	16.34 0.36	87.4 1.9	55.60 1.58	41.0 1.8	26.28 0.15	67.4 0.8
18	15.98 0.26	85.5 2.2	54.02 1.44	39.2 2.2	26.13 0.12	66.6 1.1
28	15.72 0.16	83.3 2.5	52.58 1.23	37.0 2.7	26.01 0.08	65.5 1.4
Nov. 7	15.56 0.03	80.8 2.6	51.35 0.99	34.3 3.1	25.93 0.04	64.1 1.7
17	15.53 0.09	78.2 2.7	50.36 0.73	31.2 3.2	25.89 0.00	62.4 1.9
27	15.62 0.21	75.5 2.6	49.63 0.43	28.0 3.5	25.89 0.05	60.5 2.1
Dec. 7	15.83 0.34	72.9 2.4	49.20 0.10	24.5 3.5	25.94 0.10	58.4 2.3
17	16.17 0.45	70.5 2.1	49.10 0.23	21.0 3.5	26.04 0.15	56.1 2.3
27	16.62 0.55	68.4 1.8	49.33 0.53	17.5 3.3	26.19 0.19	53.8 1.2
37	17.17	66.6	49.86	14.2	26.38	51.6

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β DRACONIS.		α OPHIUCHI.		σ OCTANTIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h 17 ^m 27	[°] 52 ['] 23	^h 17 ^m 28	[°] 12 ['] 39	^h 17	[°] 89 ['] 16
Jan. 1	18.62 0.21	70.3 3.4	34.17 0.20	44.0 2.2	52 ^m 30.06 ^s 9.80	35.6 3.1
11	18.83 0.26	66.9 3.1	34.37 0.23	41.8 2.1	52 39.86 12.65	32.5 2.8
21	19.09 0.32	63.8 2.7	34.60 0.25	39.7 1.8	52 52.51 15.11	29.7 2.4
31	19.41 0.36	61.1 2.2	34.85 0.27	37.9 1.4	53 7.62 17.15	27.3 2.0
Feb. 10	19.77 0.38	58.9 1.6	35.12 0.28	36.5 1.2	53 24.77 18.73	25.3 1.5
20	20.15 0.41	57.3 1.1	35.40 0.29	35.3 0.9	53 43.50 19.83	23.8 1.1
March 2	20.56 0.42	56.2 0.4	35.69 0.29	34.4 0.4	54 3.33 20.47	22.7 0.6
12	20.98 0.41	55.8 0.2	35.98 0.29	34.0 0.0	54 23.80 20.62	22.1 0.2
22	21.39 0.39	56.0 0.9	36.27 0.29	34.0 0.4	54 44.42 20.33	21.9 0.4
April 1	21.78 0.36	56.9 1.5	36.56 0.27	34.4 0.9	55 4.75 19.64	22.3 0.9
11	22.14 0.34	58.4 2.0	36.83 0.25	35.3 1.2	55 24.39 18.52	23.2 1.3
21	22.48 0.30	60.4 2.5	37.08 0.23	36.5 1.4	55 42.91 17.01	24.5 1.6
May 1	22.78 0.25	62.9 2.8	37.31 0.21	37.9 1.7	55 59.92 15.16	26.1 2.0
11	23.03 0.21	65.7 3.1	37.52 0.19	39.6 1.9	56 15.08 13.00	28.1 2.4
21	23.24 0.15	68.8 3.3	37.71 0.16	41.5 2.0	56 28.08 10.56	30.5 2.7
31	23.39 0.09	72.1 3.3	37.87 0.12	43.5 2.0	56 38.64 7.87	33.2 2.9
June 10	23.48 0.03	75.4 3.3	37.99 0.09	45.5 2.0	56 46.51 5.01	36.1 3.0
20	23.51 0.03	78.7 3.2	38.08 0.05	47.5 2.0	56 51.52 2.04	39.1 3.0
30	23.48 0.09	81.9 3.0	38.13 0.01	49.5 1.3	56 53.56 1.01	42.1 3.0
July 10	23.39 0.14	84.9 2.8	38.14 0.03	51.4 1.6	56 52.55 3.98	45.1 2.9
20	23.25 0.20	87.7 2.4	38.11 0.07	53.0 1.4	56 48.57 6.83	48.0 2.6
30	23.05 0.25	90.1 2.0	38.04 0.10	54.4 1.2	56 41.74 9.49	50.6 2.3
Aug. 9	22.80 0.29	92.1 1.6	37.94 0.14	55.6 1.0	56 32.25 11.85	52.9 2.0
19	22.51 0.31	93.7 1.0	37.80 0.16	56.6 0.8	56 20.40 13.80	54.9 1.6
29	22.20 0.34	94.7 0.6	37.64 0.17	57.4 0.5	56 6.60 15.29	56.5 1.0
Sept. 8	21.86 0.35	95.3 0.1	37.47 0.19	57.9 0.2	55 51.31 16.22	57.5 0.4
18	21.51 0.36	95.4 0.3	37.28 0.19	58.1 0.2	55 35.09 16.56	57.9 0.2
28	21.15 0.34	95.1 0.9	37.09 0.18	57.9 0.4	55 18.53 16.22	57.7 0.8
Oct. 8	20.81 0.32	94.2 1.4	36.91 0.16	57.5 0.7	55 2.31 15.25	56.9 1.4
18	20.49 0.28	92.8 1.9	36.75 0.13	56.8 0.9	54 47.06 13.67	55.5 1.9
28	20.21 0.23	90.9 2.3	36.62 0.10	55.9 1.1	54 33.39 11.52	53.6 2.3
Nov. 7	19.98 0.18	88.6 2.7	36.52 0.05	54.8 1.5	54 21.87 8.86	51.3 2.8
17	19.80 0.12	85.9 3.0	36.47 0.01	53.3 1.8	54 13.01 5.84	48.5 3.2
27	19.68 0.05	82.9 3.4	36.46 0.03	51.5 2.0	54 7.17 2.53	45.3 3.4
Dec. 7	19.63 0.03	79.5 3.4	36.49 0.08	49.5 2.1	54 4.64 0.91	41.9 3.4
17	19.66 0.11	76.1 3.5	36.57 0.14	47.4 2.1	54 5.55 4.29	38.5 3.2
27	19.77 0.17	72.6 3.5	36.71 0.17	45.3 2.2	54 9.84 7.61	35.3 3.2
37	19.94	69.1	36.88	43.1	54 17.45	32.1

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sideral Day of the Month.	γ DRACONIS.		μ^1 Sagittarii.		α LYRÆ. (Vega.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 17 ^m 53	[°] 51 ['] 30	^h 18 ^m 5	[°] 21 ['] 5	^h 18 ^m 32	[°] 38 ['] 39
Jan. 1	23.89 0.18	20.5 3.4	33.92 0.19	25.7 0.2	16.98 0.12	30.4 3.2
11	24.07 0.23	17.1 3.2	34.11 0.23	25.9 0.1	17.10 0.17	27.2 2.9
21	24.30 0.28	13.9 2.8	34.34 0.25	26.0 0.2	17.27 0.21	24.3 2.7
31	24.58 0.33	11.1 2.4	34.59 0.28	26.2 0.2	17.48 0.25	21.6 2.4
Feb. 10	24.91 0.36	8.7 1.9	34.87 0.30	26.4 0.1	17.73 0.28	19.2 2.0
20	25.27 0.38	6.8 1.3	35.17 0.31	26.5 0.1	18.01 0.30	17.2 1.4
March 2	25.65 0.40	5.5 0.7	35.48 0.31	26.6 0.0	18.31 0.32	15.8 1.0
12	26.05 0.40	4.8 0.0	35.79 0.32	26.6 0.1	18.63 0.34	14.8 0.3
22	26.45 0.40	4.8 0.5	36.11 0.31	26.5 0.2	18.97 0.34	14.5 0.3
April 1	26.85 0.38	5.3 1.2	36.42 0.31	26.3 0.3	19.31 0.34	14.8 0.8
11	27.23 0.35	6.5 1.8	36.73 0.30	26.0 0.3	19.65 0.32	15.6 1.4
21	27.58 0.32	8.3 2.4	37.03 0.29	25.7 0.3	19.97 0.30	17.0 2.0
May 1	27.90 0.29	10.7 2.7	37.32 0.26	25.4 0.4	20.27 0.28	19.0 2.4
11	28.19 0.24	13.4 3.0	37.58 0.24	25.0 0.4	20.55 0.26	21.4 2.6
21	28.43 0.18	16.4 3.3	37.82 0.22	24.6 0.4	20.81 0.22	24.0 2.8
31	28.61 0.13	19.7 3.3	38.04 0.19	24.2 0.3	21.03 0.18	26.8 3.1
June 10	28.74 0.08	23.0 3.3	38.23 0.15	23.9 0.3	21.21 0.14	29.9 3.1
20	28.82 0.01	26.3 3.3	38.38 0.12	23.6 0.2	21.35 0.08	33.0 3.2
30	28.83 0.05	29.6 3.2	38.50 0.07	23.4 0.2	21.43 0.03	36.2 3.1
July 10	28.78 0.11	32.8 2.9	38.57 0.02	23.2 0.1	21.46 0.02	39.3 2.9
20	28.67 0.16	35.7 2.6	38.59 0.03	23.1 0.0	21.44 0.06	42.2 2.7
30	28.51 0.22	38.3 2.3	38.56 0.07	23.1 0.0	21.38 0.11	44.9 2.4
Aug. 9	28.29 0.26	40.6 1.9	38.49 0.10	23.1 0.0	21.27 0.16	47.3 2.1
19	28.03 0.30	42.5 1.4	38.39 0.14	23.1 0.0	21.11 0.20	49.4 1.6
29	27.73 0.32	43.9 0.9	38.25 0.16	23.1 0.0	20.91 0.22	51.0 1.3
Sept. 8	27.41 0.34	44.8 0.5	38.09 0.18	23.1 0.0	20.69 0.25	52.3 0.9
18	27.07 0.35	45.3 0.1	37.91 0.19	23.1 0.0	20.44 0.25	53.2 0.4
28	26.72 0.34	45.2 0.6	37.72 0.19	23.1 0.1	20.19 0.26	53.6 0.1
Oct. 8	26.38 0.32	44.6 1.1	37.53 0.17	23.0 0.2	19.93 0.25	53.5 0.5
18	26.06 0.30	43.5 1.4	37.36 0.14	22.8 0.1	19.68 0.24	53.0 1.0
28	25.76 0.25	42.1 2.0	37.22 0.11	22.7 0.2	19.44 0.20	52.0 1.4
Nov. 7	25.51 0.20	40.1 2.5	37.11 0.06	22.5 0.1	19.24 0.17	50.6 1.9
17	25.31 0.15	37.6 2.8	37.05 0.02	22.4 0.1	19.07 0.12	48.7 2.2
27	25.16 0.08	34.8 3.1	37.03 0.03	22.3 0.1	18.95 0.08	46.5 2.6
Dec. 7	25.08 0.00	31.7 3.3	37.06 0.06	22.2 0.0	18.87 0.02	43.9 2.9
17	25.08 0.06	28.4 3.4	37.12 0.12	22.2 0.1	18.85 0.04	41.0 3.0
27	25.14 0.13	25.0 3.5	37.24 0.16	22.3 0.2	18.89 0.08	38.0 3.1
37	25.27	21.5	37.40	22.5	18.97	34.9

after the 22d of March it begins at the Sideral Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sideral Day of the Month.	β LYRE.		ζ AQUILÆ.		δ AQUILÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 18 ^m 45	[°] 33 ['] 12	^h 18 ^m 59	[°] 13 ['] 39	^h 19 ^m 18	[°] 2 ['] 50
Jan. 1	0.44 0.10	22.9 2.8	6.26 0.12	48.6 2.0	35.08 0.10	43.5 1.5
11	0.54 0.15	20.1 2.8	6.38 0.15	46.6 1.9	35.18 0.13	42.0 1.3
21	0.69 0.20	17.3 2.6	6.53 0.17	44.7 1.8	35.31 0.17	40.7 1.0
31	0.89 0.23	14.7 2.3	6.70 0.20	42.9 1.6	35.48 0.19	39.7 1.0
Feb. 10	1.12 0.26	12.4 2.0	6.90 0.23	41.3 1.2	35.67 0.22	38.7 0.8
20	1.38 0.28	10.4 1.4	7.13 0.26	40.1 1.0	35.89 0.24	37.9 0.6
March 2	1.66 0.30	9.0 0.9	7.39 0.27	39.1 0.6	36.13 0.26	37.3 0.3
12	1.96 0.32	8.1 0.4	7.66 0.28	38.5 0.2	36.39 0.27	37.0 0.0
22	2.28 0.32	7.7 0.1	7.94 0.29	38.3 0.3	36.66 0.28	37.0 0.4
April 1	2.60 0.32	7.8 0.7	8.23 0.29	38.6 0.7	36.94 0.29	37.4 0.7
11	2.92 0.31	8.5 1.3	8.52 0.28	39.3 1.1	37.23 0.29	38.1 1.0
21	3.23 0.29	9.8 1.7	8.80 0.27	40.4 1.4	37.52 0.28	39.1 1.3
May 1	3.52 0.28	11.5 2.2	9.07 0.28	41.8 1.7	37.80 0.28	40.4 1.5
11	3.80 0.26	13.7 2.5	9.35 0.26	43.5 2.0	38.08 0.27	41.9 1.6
21	4.06 0.23	16.2 2.7	9.61 0.23	45.5 2.1	38.35 0.25	43.5 1.7
31	4.29 0.19	18.9 2.9	9.84 0.20	47.6 2.2	38.60 0.23	45.2 1.8
June 10	4.48 0.15	21.8 3.0	10.04 0.17	49.8 2.3	38.83 0.19	47.0 1.9
20	4.63 0.11	24.8 3.1	10.21 0.14	52.1 2.3	39.02 0.16	48.9 1.8
30	4.74 0.06	27.9 3.0	10.35 0.09	54.4 2.2	39.18 0.12	50.7 1.7
July 10	4.80 0.01	30.9 2.8	10.44 0.05	56.6 2.0	39.30 0.07	52.4 1.5
20	4.81 0.04	33.7 2.5	10.49 0.00	58.6 1.9	39.37 0.03	53.9 1.4
30	4.77 0.09	36.2 2.3	10.49 0.04	60.5 1.7	39.40 0.01	55.3 1.2
Aug. 9	4.68 0.13	38.5 2.0	10.45 0.08	62.2 1.4	39.39 0.06	56.5 1.1
19	4.55 0.17	40.5 1.7	10.37 0.11	63.6 1.2	39.33 0.09	57.6 0.9
29	4.38 0.20	42.2 1.3	10.26 0.14	64.8 0.9	39.24 0.13	58.5 0.7
Sept. 8	4.18 0.22	43.5 0.9	10.12 0.17	65.7 0.7	39.11 0.15	59.2 0.4
18	3.96 0.22	44.4 0.5	9.95 0.19	66.4 0.3	38.96 0.16	59.6 0.2
28	3.74 0.24	44.9 0.1	9.76 0.19	66.7 0.0	38.80 0.18	59.8 0.0
Oct. 8	3.50 0.23	45.0 0.4	9.57 0.19	66.7 0.2	38.62 0.17	59.8 0.2
18	3.27 0.22	44.6 0.8	9.38 0.17	66.5 0.6	38.45 0.16	59.6 0.3
28	3.05 0.19	43.8 1.3	9.21 0.15	65.9 0.8	38.29 0.15	59.3 0.5
Nov. 7	2.86 0.16	42.5 1.6	9.06 0.12	65.1 1.0	38.14 0.12	58.8 0.8
17	2.70 0.11	40.9 2.0	8.94 0.08	64.1 1.3	38.02 0.08	58.0 1.0
27	2.59 0.07	38.9 2.4	8.86 0.04	62.8 1.6	37.94 0.04	57.0 1.1
Dec. 7	2.52 0.02	36.5 2.6	8.82 0.00	61.2 1.8	37.90 0.01	55.9 1.1
17	2.50 0.03	33.9 2.8	8.82 0.04	59.4 1.9	37.89 0.04	54.8 1.2
27	2.53 0.08	31.1 2.9	8.86 0.08	57.5 2.0	37.93 0.07	53.6 1.3
37	2.61	28.2	8.94	55.5	38.00	52.3

NOTE. — Before the 22d of March the Sideral day of the Month begins at the Sideral Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ AQUILÆ.		α AQUILÆ. (Akhair.)		β AQUILÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 19 ^m 39	[°] 10 ['] 16	^h 19 ^m 44	[°] 8 ['] 30	^h 19 ^m 48	[°] 6 ['] 3
Jan. 1	44.41 0.07	59.2 1.6	5.59 0.07	36.8 1.6	34.68 0.06	65.2 1.4
11	44.48 0.11	57.6 1.7	5.66 0.11	35.2 1.5	34.74 0.10	63.8 1.5
21	44.59 0.14	55.9 1.6	5.77 0.14	33.7 1.5	34.84 0.14	62.3 1.3
31	44.73 0.17	54.3 1.4	5.91 0.17	32.2 1.3	34.96 0.17	61.0 1.2
Feb. 10	44.90 0.20	52.9 1.1	6.06 0.19	30.9 1.0	35.15 0.19	59.8 0.9
20	45.10 0.22	51.8 0.9	6.27 0.22	29.9 0.7	35.34 0.21	58.9 0.7
March 2	45.32 0.25	50.9 0.5	6.49 0.25	29.2 0.4	35.55 0.24	58.2 0.4
12	45.57 0.26	50.4 0.1	6.74 0.26	28.8 0.1	35.79 0.26	57.8 0.0
22	45.83 0.28	50.3 0.2	7.00 0.28	28.7 0.2	36.05 0.28	57.8 0.3
April 1	46.11 0.29	50.5 0.6	7.28 0.29	28.9 0.6	36.33 0.29	58.1 0.7
11	46.40 0.29	51.1 1.0	7.57 0.29	29.5 1.0	36.62 0.30	58.8 1.0
21	46.69 0.28	52.1 1.3	7.86 0.29	30.5 1.4	36.92 0.29	59.8 1.2
May 1	46.97 0.29	53.4 1.6	8.15 0.28	31.9 1.6	37.21 0.29	61.0 1.5
11	47.26 0.28	55.0 1.9	8.43 0.28	33.5 1.8	37.50 0.27	62.5 1.8
21	47.54 0.26	56.9 2.1	8.71 0.26	35.3 2.0	37.77 0.26	64.3 1.9
31	47.80 0.24	59.0 2.2	8.97 0.25	37.3 2.1	38.03 0.24	66.2 1.9
June 10	48.04 0.20	61.2 2.1	9.22 0.21	39.4 2.1	38.27 0.22	68.1 2.0
20	48.24 0.17	63.3 2.2	9.43 0.18	41.5 2.2	38.49 0.18	70.1 2.0
30	48.41 0.14	65.5 2.1	9.61 0.14	43.7 2.1	38.67 0.14	72.1 1.9
July 10	48.55 0.09	67.6 2.0	9.75 0.09	45.8 1.9	38.81 0.10	74.0 1.9
20	48.64 0.04	69.6 1.9	9.84 0.05	47.7 1.7	38.91 0.06	75.9 1.7
30	48.68 0.00	71.5 1.7	9.89 0.01	49.4 1.6	38.97 0.02	77.6 1.5
Aug. 9	48.68 0.04	73.2 1.4	9.90 0.04	51.0 1.4	38.99 0.03	79.1 1.2
19	48.64 0.09	74.6 1.2	9.86 0.08	52.4 1.2	38.96 0.08	80.3 1.0
29	48.55 0.12	75.8 1.0	9.78 0.11	53.6 0.9	38.88 0.11	81.3 0.9
Sept. 8	48.43 0.14	76.8 0.7	9.67 0.14	54.5 0.7	38.77 0.14	82.2 0.6
18	48.29 0.17	77.5 0.5	9.53 0.16	55.2 0.5	38.63 0.15	82.8 0.4
28	48.12 0.17	78.0 0.2	9.37 0.17	55.7 0.2	38.48 0.17	83.2 0.1
Oct. 8	47.95 0.18	78.2 0.1	9.20 0.18	55.9 0.1	38.31 0.18	83.3 0.1
18	47.77 0.17	78.1 0.3	9.02 0.17	55.8 0.3	38.13 0.16	83.2 0.3
28	47.60 0.15	77.8 0.6	8.85 0.15	55.5 0.5	37.97 0.16	82.9 0.5
Nov. 7	47.45 0.13	77.2 0.9	8.70 0.13	55.0 0.8	37.81 0.13	82.4 0.8
17	47.32 0.11	76.3 1.1	8.57 0.11	54.2 1.1	37.68 0.10	81.6 1.0
27	47.21 0.07	75.2 1.2	8.46 0.07	53.1 1.2	37.58 0.07	80.6 1.1
Dec. 7	47.14 0.03	74.0 1.4	8.39 0.03	51.9 1.2	37.51 0.03	79.5 1.2
17	47.11 0.01	72.6 1.6	8.36 0.00	50.7 1.5	37.48 0.00	78.3 1.4
27	47.12 0.06	71.0 1.7	8.36 0.05	49.2 1.6	37.48 0.04	76.9 1.5
37	47.18	69.3	8.41	47.6	37.52	75.4

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	λ Ursæ Minoris.			α² CAPRICORNI.			α Pavonis.		
	Right Ascension.		Dec. North.	Right Ascension.		Dec. South.	Right Ascension.		Dec. South.
	^h 19 ^m	^s	88° 53'	^h 20 ^m 10 ^s	^s	12° 57'	^h 20 ^m 14 ^s	^s	57° 9'
Jan. 1	59 42.61	4.41	67.8 3.0	26.85 0.05	59.1 0.3	46.79 0.05	72.8 2.4		
11	59 38.20	2.16	64.8 3.1	26.90 0.10	59.4 0.2	46.84 0.13	70.4 2.4		
21	59 36.04	0.09	61.7 3.2	27.00 0.13	59.6 0.1	46.97 0.19	68.0 2.5		
31	59 36.13	2.34	58.5 3.1	27.13 0.15	59.7 0.0	47.16 0.25	65.5 2.5		
Feb. 10	59 38.47	4.49	55.4 2.9	27.28 0.19	59.7 0.1	47.41 0.31	63.0 2.4		
20	59 42.96	6.44	52.5 2.6	27.47 0.21	59.6 0.3	47.72 0.35	60.6 2.3		
March 2	59 49.40	8.11	49.9 2.2	27.68 0.24	59.3 0.4	48.07 0.39	58.3 2.1		
12	59 57.51	9.42	47.7 1.6	27.92 0.26	58.9 0.6	48.46 0.43	56.2 1.9		
22	60 6.93	10.37	46.1 1.1	28.18 0.27	58.3 0.9	48.89 0.46	54.3 1.8		
April 1	60 17.30	10.88	45.0 0.5	28.45 0.29	57.4 1.1	49.35 0.49	52.5 1.5		
11	60 28.18	11.00	44.5 0.1	28.74 0.30	56.3 1.1	49.84 0.50	51.0 1.2		
21	60 39.18	10.71	44.6 0.7	29.04 0.30	55.2 1.2	50.34 0.50	49.8 0.9		
May 1	60 49.89	10.06	45.3 1.3	29.34 0.31	54.0 1.3	50.84 0.51	48.9 0.5		
11	60 59.95	9.08	46.6 1.8	29.65 0.30	52.7 1.3	51.35 0.50	48.4 0.2		
21	61 9.03	7.82	48.4 2.3	29.95 0.29	51.4 1.4	51.85 0.48	48.2 0.1		
31	61 16.85	6.30	50.7 2.7	30.24 0.27	50.0 1.4	52.33 0.45	48.3 0.5		
June 10	61 23.15	4.63	53.4 3.0	30.51 0.25	48.6 1.2	52.78 0.40	48.8 0.8		
20	61 27.78	2.84	56.4 3.2	30.76 0.21	47.4 1.1	53.18 0.35	49.6 1.1		
30	61 30.62	0.97	59.6 3.4	30.97 0.17	46.3 1.0	53.53 0.29	50.7 1.4		
July 10	61 31.59	0.90	63.0 3.4	31.14 0.14	45.3 0.8	53.82 0.31	52.1 1.7		
20	61 30.69	2.74	66.4 3.4	31.28 0.09	44.5 0.6	54.03 0.13	53.8 1.8		
30	61 27.95	4.53	69.8 3.4	31.37 0.04	43.9 0.4	54.16 0.05	55.6 1.9		
Aug. 9	61 23.42	6.22	73.2 3.2	31.41 0.00	43.5 0.3	54.21 0.02	57.5 2.0		
19	61 17.20	7.77	76.4 3.0	31.41 0.05	43.2 0.2	54.19 0.10	59.5 1.9		
29	61 9.43	9.16	79.4 2.7	31.36 0.09	43.0 0.0	54.09 0.17	61.4 1.8		
Sept. 8	61 0.27	10.38	82.1 2.4	31.27 0.12	43.0 0.1	53.92 0.23	63.2 1.6		
18	60 49.89	11.38	84.5 1.9	31.15 0.14	43.1 0.1	53.69 0.28	64.8 1.4		
28	60 38.51	12.15	86.4 1.5	31.01 0.16	43.2 0.2	53.41 0.31	66.2 1.0		
Oct. 8	60 26.36	12.66	87.9 1.0	30.85 0.17	43.4 0.3	53.10 0.33	67.2 0.6		
18	60 13.70	12.90	88.9 0.6	30.68 0.17	43.7 0.4	52.77 0.34	67.8 0.3		
28	60 0.80	12.84	89.5 0.0	30.51 0.16	44.1 0.3	52.43 0.32	68.1 0.2		
Nov. 7	59 47.96	12.44	89.5 0.6	30.35 0.14	44.4 0.3	52.11 0.29	67.9 0.7		
17	59 35.52	11.71	88.9 1.0	30.21 0.10	44.7 0.4	51.82 0.24	67.2 1.0		
27	59 23.81	10.64	87.9 1.6	30.11 0.07	45.1 0.4	51.58 0.18	66.2 1.4		
Dec. 7	59 13.17	9.27	86.3 2.1	30.04 0.04	45.5 0.3	51.40 0.14	64.8 1.7		
17	59 3.90	7.59	84.2 2.6	30.00 0.01	45.8 0.3	51.26 0.06	63.1 2.0		
27	58 56.31	5.62	81.6 2.9	29.99 0.02	46.1 0.4	51.20 0.01	61.1 2.2		
37	58 50.69		78.7	30.01	46.5	51.21	58.9		

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α CYGNI.		61 ¹ CYGNI.		ζ Cygni.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h ^m 20 36	[°] ['] 44 47	^h ^m 21 0	[°] ['] 38 4	^h ^m 21 7	[°] ['] 29 39
Jan. 1	44.84 0.05	43.9 2.8	44.77 0.04	51.8 2.4	6.04 0.04	71.2 2.2
11	44.79 0.01	41.1 2.9	44.73 0.01	49.4 2.5	6.00 0.00	69.0 2.3
21	44.80 0.06	38.2 2.9	44.72 0.04	46.9 2.6	6.00 0.03	66.7 2.3
31	44.86 0.12	35.3 2.8	44.76 0.10	44.3 2.6	6.03 0.08	64.4 2.3
Feb. 10	44.98 0.16	32.5 2.6	44.86 0.13	41.7 2.4	6.11 0.12	62.1 2.1
20	45.14 0.20	29.9 2.4	44.99 0.17	39.3 2.0	6.23 0.15	60.0 1.8
March 2	45.34 0.25	27.5 2.0	45.16 0.22	37.3 1.7	6.38 0.19	58.2 1.5
12	45.59 0.28	25.5 1.4	45.38 0.26	35.6 1.2	6.57 0.22	56.7 1.0
22	45.87 0.32	24.1 0.8	45.64 0.28	34.4 0.8	6.79 0.26	55.7 0.6
April 1	46.19 0.35	23.3 0.2	45.92 0.31	33.6 0.2	7.05 0.28	55.1 0.1
11	46.54 0.36	23.1 0.3	46.23 0.34	33.4 0.3	7.33 0.30	55.0 0.3
21	46.90 0.37	23.4 0.8	46.57 0.36	33.7 0.9	7.63 0.32	55.3 0.8
May 1	47.27 0.38	24.2 1.4	46.93 0.36	34.6 1.3	7.95 0.33	56.1 1.3
11	47.65 0.36	25.6 1.9	47.29 0.36	35.9 1.8	8.28 0.33	57.4 1.8
21	48.01 0.35	27.5 2.4	47.65 0.35	37.7 2.3	8.61 0.32	59.2 2.2
31	48.36 0.31	29.9 2.7	48.00 0.33	40.0 2.6	8.93 0.30	61.4 2.4
June 10	48.67 0.28	32.6 3.0	48.33 0.29	42.6 3.0	9.23 0.27	63.8 2.7
20	48.95 0.24	35.6 3.3	48.62 0.26	45.6 3.2	9.50 0.25	66.5 2.8
30	49.19 0.19	38.9 3.3	48.88 0.22	48.8 3.3	9.75 0.22	69.3 2.9
July 10	49.38 0.14	42.2 3.4	49.10 0.18	52.1 3.3	9.97 0.17	72.2 3.0
20	49.52 0.07	45.6 3.4	49.28 0.12	55.4 3.2	10.14 0.12	75.2 2.9
30	49.59 0.02	49.0 3.3	49.40 0.07	58.6 3.2	10.26 0.07	78.1 2.8
Aug. 9	49.61 0.04	52.3 3.1	49.47 0.01	61.8 3.0	10.33 0.02	80.9 2.6
19	49.57 0.09	55.4 2.8	49.48 0.04	64.8 2.9	10.35 0.02	83.5 2.5
29	49.48 0.14	58.2 2.5	49.44 0.08	67.7 2.6	10.33 0.07	86.0 2.2
Sept. 8	49.34 0.18	60.7 2.2	49.36 0.12	70.3 2.3	10.26 0.10	88.2 1.9
18	49.16 0.22	62.9 1.9	49.24 0.15	72.6 1.9	10.16 0.14	90.1 1.5
28	48.94 0.24	64.8 1.4	49.09 0.18	74.5 1.5	10.02 0.16	91.6 1.2
Oct. 8	48.70 0.26	66.2 0.9	48.91 0.20	76.0 1.1	9.86 0.18	92.8 0.8
18	48.44 0.26	67.1 0.3	48.71 0.22	77.1 0.5	9.68 0.19	93.6 0.4
28	48.18 0.27	67.4 0.1	48.49 0.22	77.6 0.1	9.49 0.19	94.0 0.0
Nov. 7	47.91 0.25	67.3 0.6	48.27 0.20	77.7 0.3	9.30 0.19	94.0 0.4
17	47.66 0.23	66.7 1.1	48.07 0.19	77.4 0.7	9.11 0.17	93.6 0.8
27	47.43 0.20	65.6 1.5	47.88 0.17	76.7 1.1	8.94 0.15	92.8 1.2
Dec. 7	47.23 0.16	64.1 2.0	47.71 0.14	75.6 1.6	8.79 0.12	91.6 1.5
17	47.07 0.11	62.1 2.3	47.57 0.10	74.0 2.0	8.67 0.09	90.1 1.8
27	46.96 0.08	59.8 2.7	47.47 0.06	72.0 2.3	8.58 0.06	88.3 2.1
37	46.88	57.1	47.41	69.7	8.52	86.2

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	β URSE MINORIS.		β LIBRÆ.		α CORONÆ BOREALIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 14 ^m 51	[°] 74 ['] 42	^h 15 ^m 9	[°] 8 ['] 52	^h 15 ^m 28	[°] 27 ['] 10
Jan. 1	5.08 0.78	34.2 2.3	38.58 0.32	31.5 1.6	53.07 0.30	29.7 2.6
11	5.86 0.83	31.9 1.7	38.90 0.32	33.1 1.6	53.37 0.32	27.1 2.2
21	6.69 0.86	30.2 1.0	39.22 0.32	34.7 1.6	53.69 0.32	24.9 1.8
31	7.55 0.89	29.2 0.3	39.54 0.31	36.3 1.4	54.01 0.33	23.1 1.3
Feb. 10	8.44 0.86	28.9 0.3	39.85 0.30	37.7 1.3	54.34 0.32	21.8 0.8
20	9.30 0.80	29.2 1.0	40.15 0.29	39.0 1.0	54.66 0.31	21.0 0.3
March 2	10.10 0.72	30.2 1.6	40.44 0.27	40.0 0.8	54.97 0.27	20.7 0.2
12	10.82 0.62	31.8 2.1	40.71 0.24	40.8 0.6	55.24 0.26	20.9 0.7
22	11.44 0.50	33.9 2.6	40.95 0.21	41.4 0.5	55.50 0.24	21.6 1.1
April 1	11.94 0.37	36.5 3.0	41.16 0.19	41.9 0.2	55.74 0.20	22.7 1.5
11	12.31 0.22	39.5 3.2	41.35 0.16	42.1 0.0	55.94 0.17	24.2 1.9
21	12.53 0.07	42.7 3.3	41.51 0.12	42.1 0.2	56.11 0.13	26.1 2.1
May 1	12.60 0.07	46.0 3.3	41.63 0.10	41.9 0.3	56.24 0.10	28.2 2.3
11	12.53 0.29	49.3 3.1	41.73 0.08	41.6 0.4	56.34 0.07	30.5 2.3
21	12.33 0.33	52.4 2.8	41.81 0.04	41.2 0.6	56.41 0.02	32.8 2.3
31	12.00 0.45	55.2 2.5	41.85 0.01	40.6 0.5	56.43 0.01	35.1 2.2
June 10	11.55 0.55	57.7 2.2	41.86 0.01	40.1 0.5	56.42 0.04	37.3 2.1
20	11.00 0.63	59.9 1.8	41.85 0.04	39.6 0.6	56.38 0.07	39.4 1.9
30	10.37 0.70	61.7 1.3	41.81 0.07	39.0 0.6	56.31 0.10	41.3 1.6
July 10	9.67 0.75	63.0 0.8	41.74 0.10	38.4 0.6	56.21 0.13	42.9 1.3
20	8.92 0.80	63.8 0.2	41.64 0.12	37.8 0.6	56.08 0.16	44.2 1.1
30	8.12 0.81	64.0 0.3	41.52 0.14	37.2 0.5	55.92 0.17	45.3 0.7
Aug. 9	7.31 0.80	63.7 0.8	41.38 0.15	36.7 0.5	55.75 0.18	46.0 0.3
19	6.51 0.80	62.9 1.3	41.23 0.15	36.2 0.5	55.57 0.19	46.3 0.1
29	5.71 0.75	61.6 1.8	41.08 0.15	35.7 0.4	55.38 0.19	46.2 0.4
Sept. 8	4.96 0.69	59.8 2.3	40.93 0.13	35.3 0.2	55.19 0.18	45.8 0.7
18	4.27 0.61	57.5 2.7	40.80 0.11	35.1 0.2	55.01 0.17	45.1 1.1
28	3.66 0.52	54.8 3.0	40.69 0.09	34.9 0.0	54.84 0.14	44.0 1.5
Oct. 8	3.14 0.41	51.8 3.3	40.60 0.05	34.9 0.1	54.70 0.10	42.5 1.8
18	2.73 0.28	48.5 3.6	40.55 0.01	35.0 0.3	54.60 0.06	40.7 2.2
28	2.45 0.14	44.9 3.8	40.54 0.04	35.3 0.5	54.54 0.01	38.5 2.5
Nov. 7	2.31 0.01	41.1 3.7	40.58 0.10	35.8 0.8	54.53 0.05	36.9 2.6
17	2.32 0.18	37.4 3.8	40.68 0.14	36.6 1.0	54.58 0.10	33.4 2.8
27	2.50 0.33	33.6 3.6	40.82 0.19	37.6 1.2	54.68 0.15	30.6 2.9
Dec. 7	2.83 0.47	30.0 3.3	41.01 0.22	38.8 1.3	54.83 0.20	27.7 2.9
17	3.30 0.60	26.7 3.0	41.23 0.27	40.1 1.4	55.03 0.24	24.8 2.9
27	3.90 0.70	23.7 2.6	41.50 0.29	41.5 1.6	55.27 0.28	21.9 2.7
37	4.60	21.1	41.79	43.1	55.55	19.2

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Ob. α /ter the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α SERPENTIS.		ζ URSE MINORIS.		β^1 SCORPII.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h ^m 15 37	[°] ['] 6 51	^h ^m 15 48	[°] ['] 78 12	^h ^m 15 57	[°] ['] 19 25
Jan. 1	31.31 0.30	26.7 2.1	55.38 0.78	36.1 2.7	28.65 0.30	37.1 0.9
11	31.61 0.30	24.6 1.9	56.16 0.91	33.4 2.3	28.95 0.32	38.0 1.1
21	31.91 0.30	22.7 1.6	57.07 1.02	31.1 1.7	29.27 0.33	39.1 1.1
31	32.21 0.30	21.1 1.3	58.09 1.08	29.4 1.0	29.60 0.33	40.2 1.1
Feb. 10	32.51 0.30	19.8 1.1	59.17 1.12	28.4 0.4	29.93 0.33	41.3 1.0
20	32.81 0.30	18.7 0.8	60.29 1.08	28.0 0.3	30.26 0.32	42.3 1.0
March 2	33.11 0.27	17.9 0.4	61.37 1.01	28.3 1.0	30.58 0.30	43.3 0.8
12	33.38 0.25	17.5 0.0	62.38 0.94	29.3 1.6	30.88 0.27	44.1 0.8
22	33.63 0.22	17.5 0.4	63.32 0.83	30.9 2.1	31.15 0.26	44.9 0.6
April 1	33.85 0.20	17.9 0.6	64.15 0.68	33.0 2.6	31.41 0.24	45.5 0.5
11	34.05 0.17	18.5 0.9	64.83 0.52	35.6 2.9	31.65 0.21	46.0 0.4
21	34.22 0.15	19.4 1.2	65.35 0.33	38.5 1.3	31.86 0.19	46.4 0.2
May 1	34.37 0.12	20.6 1.3	65.68 0.15	41.6 3.3	32.05 0.16	46.6 0.2
11	34.49 0.09	21.9 1.4	65.83 0.04	44.9 3.3	32.21 0.13	46.8 0.1
21	34.58 0.06	23.3 1.4	65.79 0.22	48.2 3.2	32.34 0.09	46.9 0.1
31	34.64 0.02	24.7 1.4	65.57 0.40	51.4 3.0	32.48 0.06	47.0 0.0
June 10	34.66 0.00	26.1 1.4	65.17 0.56	54.4 2.7	32.49 0.03	47.0 0.1
20	34.66 0.03	27.5 1.2	64.61 0.70	57.1 2.4	32.52 0.01	46.9 0.2
30	34.63 0.06	28.7 1.2	63.91 0.83	59.5 2.0	32.51 0.05	46.7 0.2
July 10	34.57 0.09	29.9 1.0	63.08 0.92	61.5 1.5	32.46 0.08	46.5 0.2
20	34.48 0.12	30.9 0.8	62.16 1.01	63.0 1.0	32.38 0.10	46.3 0.3
30	34.36 0.14	31.7 0.7	61.15 1.08	64.0 0.5	32.28 0.13	46.0 0.3
Aug. 9	34.22 0.16	32.4 0.5	60.07 1.11	64.5 0.1	32.15 0.15	45.7 0.4
19	34.06 0.16	32.9 0.3	58.96 1.13	64.6 0.5	32.00 0.17	45.3 0.4
29	33.90 0.16	33.2 0.0	57.83 1.11	64.1 1.0	31.83 0.17	44.9 0.4
Sept. 8	33.74 0.15	33.2 0.2	56.72 1.08	63.1 1.5	31.66 0.16	44.5 0.5
18	33.59 0.14	33.0 0.4	55.64 1.01	61.6 2.0	31.50 0.15	44.0 0.5
28	33.45 0.12	32.6 0.6	54.63 0.91	59.6 2.4	31.35 0.13	43.5 0.4
Oct. 8	33.33 0.08	32.0 0.9	53.72 0.80	57.2 2.8	31.22 0.09	43.1 0.4
18	33.25 0.03	31.1 1.1	52.92 0.66	54.4 3.2	31.13 0.04	42.7 0.3
28	33.22 0.01	30.0 1.3	52.26 0.50	51.2 3.4	31.09 0.00	42.4 0.2
Nov. 7	33.23 0.05	28.7 1.6	51.76 0.29	47.8 3.6	31.09 0.04	42.2 0.0
17	33.28 0.10	27.1 1.9	51.47 0.09	44.2 3.7	31.13 0.11	42.2 0.2
27	33.38 0.15	25.2 2.0	51.38 0.11	40.5 3.6	31.24 0.16	42.4 0.4
Dec. 7	33.53 0.20	23.2 2.0	51.49 0.31	36.9 3.5	31.40 0.19	42.8 0.5
17	33.73 0.23	21.2 2.1	51.80 0.51	33.4 3.4	31.59 0.24	43.3 0.7
27	33.96 0.25	19.1 2.1	52.31 0.68	30.0 3.0	31.83 0.28	44.0 0.8
37	34.21	17.0	52.99	27.0	32.11	44.8

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sideral Day of the Month.	δ OPHIUCHI.		α SCORPII. (Antares.)		γ Draconis.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	$^h \quad ^m$ 16 7	$^{\circ} \quad 20'$ 3 20'	$^h \quad ^m$ 16 21	$^{\circ} \quad 7'$ 26 7'	$^h \quad ^m$ 16 22	$^{\circ} \quad 49'$ 61 49'
Jan. 1	10.09 0.27	21.1 1.6	0.77 0.30	26.1 0.6	6.79 0.35	19.1 3.2
11	10.36 0.30	22.7 1.5	1.07 0.32	26.7 0.6	7.14 0.41	15.9 2.7
21	10.66 0.31	24.2 1.4	1.39 0.33	27.3 0.7	7.55 0.47	13.2 2.1
31	10.97 0.30	25.6 1.3	1.72 0.34	28.0 0.8	8.02 0.50	11.1 1.6
Feb. 10	11.27 0.31	26.9 1.1	2.06 0.35	28.8 0.8	8.52 0.51	9.5 1.0
20	11.58 0.30	28.0 0.9	2.41 0.34	29.6 0.8	9.03 0.52	8.5 0.3
March 2	11.88 0.28	28.9 0.5	2.75 0.33	30.4 0.8	9.55 0.50	8.2 0.4
12	12.16 0.27	29.4 0.5	3.08 0.31	31.2 0.7	10.05 0.47	8.6 1.0
22	12.43 0.25	29.9 0.2	3.39 0.28	31.9 0.7	10.52 0.44	9.6 1.6
April 1	12.68 0.23	29.7 0.2	3.67 0.27	32.6 0.6	10.96 0.37	11.2 2.2
11	12.91 0.20	29.5 0.4	3.94 0.24	33.2 0.6	11.33 0.32	13.4 2.6
21	13.11 0.18	29.1 0.7	4.18 0.21	33.8 0.5	11.65 0.26	16.0 3.0
May 1	13.29 0.15	28.4 0.8	4.39 0.18	34.3 0.5	11.91 0.19	19.0 3.2
11	13.44 0.12	27.6 0.8	4.57 0.16	34.8 0.4	12.10 0.11	22.2 3.3
21	13.56 0.09	26.8 1.0	4.73 0.13	35.2 0.3	12.21 0.02	25.5 3.3
31	13.65 0.06	25.8 1.0	4.86 0.09	35.5 0.3	12.23 0.05	28.8 3.2
June 10	13.71 0.03	24.8 1.0	4.95 0.05	35.8 0.3	12.18 0.12	32.0 3.1
20	13.74 0.00	23.8 0.9	5.00 0.02	36.1 0.2	12.06 0.18	35.1 2.8
30	13.74 0.04	22.9 0.8	5.02 0.02	36.3 0.2	11.88 0.25	37.9 2.5
July 10	13.70 0.07	22.1 0.8	5.00 0.07	36.5 0.1	11.63 0.31	40.4 2.1
20	13.63 0.10	21.3 0.7	4.93 0.10	36.6 0.0	11.32 0.36	42.5 1.7
30	13.53 0.13	20.6 0.6	4.83 0.13	36.6 0.1	10.96 0.40	44.2 1.2
Aug. 9	13.40 0.15	20.0 0.5	4.70 0.15	36.5 0.2	10.56 0.43	45.4 0.7
19	13.25 0.16	19.5 0.4	4.55 0.18	36.3 0.3	10.13 0.46	46.1 0.2
29	13.09 0.16	19.1 0.3	4.37 0.18	36.0 0.4	9.67 0.46	46.3 0.4
Sept. 8	12.93 0.16	18.8 0.1	4.19 0.18	35.6 0.5	9.21 0.46	45.9 0.8
18	12.77 0.15	18.7 0.0	4.01 0.17	35.1 0.6	8.75 0.44	45.1 1.4
28	12.62 0.13	18.7 0.2	3.84 0.15	34.5 0.7	8.31 0.40	43.7 1.9
Oct. 8	12.49 0.10	18.9 0.4	3.69 0.12	33.8 0.6	7.91 0.35	41.8 2.3
18	12.39 0.06	19.3 0.5	3.57 0.07	33.2 0.6	7.56 0.30	39.5 2.7
28	12.33 0.01	19.8 0.7	3.50 0.02	32.6 0.5	7.26 0.22	36.8 2.9
Nov. 7	12.32 0.03	20.5 0.9	3.48 0.03	32.1 0.4	7.04 0.15	33.9 3.3
17	12.35 0.07	21.4 1.1	3.51 0.08	31.7 0.4	6.89 0.05	30.6 3.7
27	12.42 0.13	22.5 1.3	3.59 0.13	31.3 0.2	6.84 0.05	26.9 3.8
Dec. 7	12.55 0.18	23.8 1.5	3.72 0.19	31.1 0.1	6.89 0.14	23.1 3.7
17	12.73 0.22	25.3 1.5	3.91 0.24	31.2 0.2	7.03 0.22	19.4 3.5
27	12.95 0.25	26.8 1.6	4.15 0.26	31.4 0.4	7.25 0.31	15.9 3.2
37	13.20	28.4	4.41	31.8	7.56	12.7

NOTE. — Before the 23d of March the Sideral day of the Month begins at the Sideral Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Trianguli Australis.		ε Ursæ Minoris.		α HERCULIS.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h ^m 16 34	68° 45'	^h ^m 16 59	82° 15'	^h ^m 17 8	14° 32'
Jan. 1	10.79 0.61	62.9 1.7	56.13 0.69	17.6 3.2	23.71 0.22	53.9 2.2
11	11.40 0.68	61.2 1.2	56.82 0.96	14.4 2.8	23.93 0.25	51.7 2.1
21	12.08 0.73	60.0 0.8	57.78 1.21	11.6 2.3	24.18 0.26	49.6 1.9
31	12.81 0.76	59.2 0.4	58.99 1.40	9.3 1.9	24.44 0.28	47.7 1.6
Feb. 10	13.57 0.77	58.8 0.0	60.39 1.54	7.4 1.3	24.72 0.30	46.1 1.2
20	14.34 0.78	58.8 0.4	61.93 1.60	6.1 0.6	25.02 0.29	44.9 0.8
March 2	15.12 0.76	59.2 0.8	63.53 1.62	5.5 0.0	25.31 0.30	44.1 0.3
12	15.88 0.72	60.0 1.1	65.15 1.57	5.5 0.7	25.61 0.27	43.8 0.1
22	16.60 0.69	61.1 1.5	66.72 1.47	6.2 1.4	25.88 0.28	43.9 0.4
April 1	17.29 0.64	62.6 1.8	68.19 1.34	7.6 1.9	26.16 0.26	44.3 0.9
11	17.93 0.58	64.4 2.1	69.53 1.14	9.5 2.4	26.42 0.25	45.2 1.3
21	18.51 0.52	66.5 2.2	70.67 0.90	11.9 2.7	26.67 0.22	46.5 1.6
May 1	19.03 0.43	68.7 2.4	71.57 0.64	14.6 3.0	26.89 0.19	48.1 1.8
11	19.46 0.35	71.1 2.5	72.21 0.37	17.6 3.3	27.08 0.17	49.9 2.0
21	19.81 0.26	73.6 2.5	72.58 0.08	20.9 3.3	27.25 0.14	51.9 2.0
31	20.07 0.17	76.1 2.5	72.66 0.22	24.2 3.2	27.39 0.10	53.9 2.0
June 10	20.24 0.07	78.6 2.5	72.44 0.48	27.4 3.2	27.49 0.07	55.9 2.0
20	20.31 0.03	81.1 2.3	71.96 0.73	30.6 3.0	27.56 0.03	57.9 2.0
30	20.28 0.13	83.4 2.1	71.23 0.98	33.6 2.7	27.59 0.01	59.9 1.8
July 10	20.15 0.23	85.5 1.9	70.25 1.19	36.3 2.4	27.58 0.03	61.7 1.6
20	19.92 0.32	87.4 1.5	69.06 1.37	38.7 2.0	27.53 0.08	63.3 1.5
30	19.60 0.38	88.9 1.1	67.69 1.54	40.7 1.5	27.45 0.12	64.8 1.2
Aug. 9	19.22 0.45	90.0 0.8	66.15 1.66	42.2 1.1	27.33 0.15	66.0 0.9
19	18.77 0.50	90.8 0.3	64.49 1.75	43.3 0.6	27.18 0.17	66.9 0.7
29	18.27 0.50	91.1 0.2	62.74 1.81	43.9 0.1	27.01 0.18	67.6 0.4
Sept. 8	17.77 0.51	90.9 0.7	60.93 1.82	44.0 0.5	26.83 0.18	68.0 0.1
18	17.26 0.49	90.2 1.2	59.11 1.80	43.5 1.0	26.65 0.19	68.1 0.2
28	16.77 0.43	89.0 1.6	57.31 1.71	42.5 1.5	26.46 0.18	67.9 0.5
Oct. 8	16.34 0.36	87.4 1.9	55.60 1.58	41.0 1.8	26.28 0.15	67.4 0.8
18	15.98 0.26	85.5 2.2	54.02 1.44	39.2 2.2	26.13 0.12	66.6 1.1
28	15.72 0.16	83.3 2.5	52.58 1.23	37.0 2.7	26.01 0.08	65.5 1.4
Nov. 7	15.56 0.03	80.8 2.6	51.35 0.99	34.3 3.1	25.93 0.04	64.1 1.7
17	15.53 0.09	78.2 2.7	50.36 0.73	31.2 3.2	25.89 0.00	62.4 1.9
27	15.62 0.21	75.5 2.6	49.63 0.43	28.0 3.5	25.89 0.06	60.5 2.1
Dec. 7	15.83 0.34	72.9 2.4	49.20 0.10	24.5 3.5	25.94 0.10	58.4 2.3
17	16.17 0.45	70.5 2.1	49.10 0.23	21.0 3.5	26.04 0.15	56.1 2.3
27	16.62 0.55	68.4 1.8	49.33 0.53	17.5 3.3	26.19 0.19	53.8 1.2
37	17.17	66.6	49.86	14.2	26.38	51.6

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	β DRACONIS.			α OPHEUCHI.			σ OCTANTIS.		
	Right Ascension.	Dec. North.		Right Ascension.	Dec. North.		Right Ascension.	Dec. South.	
	^h 17 ^m 27	52° 23'		^h 17 ^m 28	12° 39'		^h 17	89° 16'	
Jan. 1	18.62 0.21	70.3 3.4		34.17 0.20	44.0 2.2		52 30.06 9.80	35.6 3.1	
11	18.83 0.26	66.9 3.1		34.37 0.23	41.8 2.1		52 39.86 12.65	32.5 2.8	
21	19.09 0.32	63.8 2.7		34.60 0.25	39.7 1.8		52 52.51 15.11	29.7 2.4	
31	19.41 0.36	61.1 2.2		34.85 0.27	37.9 1.4		53 7.62 17.15	27.3 2.0	
Feb. 10	19.77 0.38	58.9 1.6		35.12 0.28	36.5 1.2		53 24.77 18.73	25.3 1.5	
20	20.15 0.41	57.3 1.1		35.40 0.29	35.3 0.9		53 43.50 19.83	23.8 1.1	
March 2	20.56 0.42	56.2 0.4		35.69 0.29	34.4 0.4		54 3.33 20.47	22.7 0.6	
12	20.98 0.41	55.8 0.2		35.98 0.29	34.0 0.0		54 23.80 20.62	22.1 0.2	
22	21.39 0.39	56.0 0.9		36.27 0.29	34.0 0.4		54 44.42 20.33	21.9 0.4	
April 1	21.78 0.36	56.9 1.5		36.56 0.27	34.4 0.9		55 4.75 19.64	22.3 0.9	
11	22.14 0.34	58.4 2.0		36.83 0.25	35.3 1.2		55 24.39 18.52	23.2 1.3	
21	22.48 0.30	60.4 2.5		37.08 0.23	36.5 1.4		55 42.91 17.01	24.5 1.6	
May 1	22.78 0.25	62.9 2.8		37.31 0.21	37.9 1.7		55 59.92 15.16	26.1 2.0	
11	23.03 0.21	65.7 3.1		37.52 0.19	39.6 1.9		56 15.08 13.00	28.1 2.4	
21	23.24 0.15	68.8 3.3		37.71 0.16	41.5 2.0		56 28.08 10.56	30.5 2.7	
31	23.39 0.09	72.1 3.3		37.87 0.12	43.5 2.0		56 38.64 7.87	33.2 2.9	
June 10	23.48 0.03	75.4 3.3		37.99 0.09	45.5 2.0		56 46.51 5.01	36.1 3.0	
20	23.51 0.03	78.7 3.2		38.08 0.05	47.5 2.0		56 51.52 2.04	39.1 3.0	
30	23.48 0.09	81.9 3.0		38.13 0.01	49.5 1.9		56 53.56 1.01	42.1 3.0	
July 10	23.39 0.14	84.9 2.8		38.14 0.03	51.4 1.6		56 52.55 3.98	45.1 2.9	
20	23.25 0.20	87.7 2.4		38.11 0.07	53.0 1.4		56 48.57 6.83	48.0 2.6	
30	23.05 0.25	90.1 2.0		38.04 0.10	54.4 1.2		56 41.74 9.49	50.6 2.3	
Aug. 9	22.80 0.29	92.1 1.6		37.94 0.14	55.6 1.0		56 32.25 11.85	52.9 2.0	
19	22.51 0.31	93.7 1.0		37.80 0.16	56.6 0.8		56 20.40 13.80	54.9 1.6	
29	22.20 0.34	94.7 0.6		37.64 0.17	57.4 0.5		56 6.60 15.29	56.5 1.0	
Sept. 8	21.86 0.35	95.3 0.1		37.47 0.19	57.9 0.2		55 51.31 16.22	57.5 0.4	
18	21.51 0.36	95.4 0.3		37.28 0.19	58.1 0.2		55 35.09 16.56	57.9 0.2	
28	21.15 0.34	95.1 0.9		37.09 0.18	57.9 0.4		55 18.53 16.22	57.7 0.8	
Oct. 8	20.81 0.32	94.2 1.4		36.91 0.16	57.5 0.7		55 2.31 15.25	56.9 1.4	
18	20.49 0.28	92.8 1.9		36.75 0.13	56.8 0.9		54 47.06 13.67	55.5 1.9	
28	20.21 0.23	90.9 2.3		36.62 0.10	55.9 1.1		54 33.39 11.52	53.6 2.3	
Nov. 7	19.98 0.18	88.6 2.7		36.52 0.05	54.8 1.5		54 21.87 8.86	51.3 2.8	
17	19.80 0.12	85.9 3.0		36.47 0.01	53.3 1.8		54 13.01 5.84	48.5 3.2	
27	19.68 0.05	82.9 3.4		36.46 0.03	51.5 2.0		54 7.17 2.53	45.3 3.4	
Dec. 7	19.63 0.03	79.5 3.4		36.49 0.08	49.5 2.1		54 4.64 0.91	41.9 3.4	
17	19.66 0.11	76.1 3.5		36.57 0.14	47.4 2.1		54 5.55 4.29	38.5 3.2	
27	19.77 0.17	72.6 3.5		36.71 0.17	45.3 2.2		54 9.84 7.61	35.3 3.2	
37	19.94	69.1		36.88	43.1		54 17.45	32.1	

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Ob. $q/2r$ the Mean Noon ;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ DRACONIS.		μ^1 Sagittarii.		α LYRÆ. (Vega.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h ^m 17 53	[°] ['] 51 30	^h ^m 18 5	[°] ['] 21 5	^h ^m 18 32	[°] ['] 38 39
Jan. 1	23.89 0.18	20.5 3.4	33.92 0.19	25.7 0.2	16.98 0.12	30.4 3.2
11	24.07 0.23	17.1 3.2	34.11 0.23	25.9 0.1	17.10 0.17	27.2 2.9
21	24.30 0.28	13.9 2.8	34.34 0.25	26.0 0.2	17.27 0.21	24.3 2.7
31	24.58 0.33	11.1 2.4	34.59 0.28	26.2 0.2	17.48 0.25	21.6 2.4
Feb. 10	24.91 0.36	8.7 1.9	34.87 0.30	26.4 0.1	17.73 0.28	19.2 2.0
20	25.27 0.38	6.8 1.3	35.17 0.31	26.5 0.1	18.01 0.30	17.2 1.4
March 2	25.65 0.40	5.5 0.7	35.48 0.31	26.6 0.0	18.31 0.32	15.8 1.0
12	26.05 0.40	4.8 0.0	35.79 0.32	26.6 0.1	18.63 0.34	14.8 0.3
22	26.45 0.40	4.8 0.5	36.11 0.31	26.5 0.2	18.97 0.34	14.5 0.3
April 1	26.85 0.38	5.3 1.2	36.42 0.31	26.3 0.3	19.31 0.34	14.8 0.8
11	27.23 0.35	6.5 1.8	36.73 0.30	26.0 0.3	19.65 0.32	15.6 1.4
21	27.58 0.32	8.3 2.4	37.03 0.29	25.7 0.3	19.97 0.30	17.0 2.0
May 1	27.90 0.29	10.7 2.7	37.32 0.26	25.4 0.4	20.27 0.28	19.0 2.4
11	28.19 0.24	13.4 3.0	37.58 0.24	25.0 0.4	20.55 0.26	21.4 2.6
21	28.43 0.18	16.4 3.3	37.82 0.22	24.6 0.4	20.81 0.22	24.0 2.8
31	28.61 0.13	19.7 3.3	38.04 0.19	24.2 0.3	21.03 0.18	26.8 3.1
June 10	28.74 0.08	23.0 3.3	38.23 0.15	23.9 0.3	21.21 0.14	29.9 3.1
20	28.82 0.01	26.3 3.3	38.38 0.12	23.6 0.2	21.35 0.08	33.0 3.2
30	28.83 0.05	29.6 3.2	38.50 0.07	23.4 0.2	21.43 0.03	36.2 3.1
July 10	28.78 0.11	32.8 2.9	38.57 0.02	23.2 0.1	21.46 0.02	39.3 2.9
20	28.67 0.16	35.7 2.6	38.59 0.03	23.1 0.0	21.44 0.06	42.2 2.7
30	28.51 0.22	38.3 2.3	38.56 0.07	23.1 0.0	21.38 0.11	44.9 2.4
Aug. 9	28.29 0.26	40.6 1.9	38.49 0.10	23.1 0.0	21.27 0.16	47.3 2.1
19	28.03 0.30	42.5 1.4	38.39 0.14	23.1 0.0	21.11 0.20	49.4 1.6
29	27.73 0.32	43.9 0.9	38.25 0.16	23.1 0.0	20.91 0.22	51.0 1.3
Sept. 8	27.41 0.34	44.8 0.5	38.09 0.18	23.1 0.0	20.69 0.25	52.3 0.9
18	27.07 0.35	45.3 0.1	37.91 0.19	23.1 0.0	20.44 0.25	53.2 0.4
28	26.72 0.34	45.2 0.6	37.72 0.19	23.1 0.1	20.19 0.26	53.6 0.1
Oct. 8	26.38 0.32	44.6 1.1	37.53 0.17	23.0 0.2	19.93 0.25	53.5 0.5
18	26.06 0.30	43.5 1.4	37.36 0.14	22.8 0.1	19.68 0.24	53.0 1.0
28	25.76 0.25	42.1 2.0	37.22 0.11	22.7 0.2	19.44 0.20	52.0 1.4
Nov. 7	25.51 0.20	40.1 2.5	37.11 0.06	22.5 0.1	19.24 0.17	50.6 1.9
17	25.31 0.15	37.6 2.8	37.05 0.02	22.4 0.1	19.07 0.12	48.7 2.2
27	25.16 0.08	34.8 3.1	37.03 0.03	22.3 0.1	18.95 0.08	46.5 2.6
Dec. 7	25.08 0.00	31.7 3.3	37.06 0.06	22.2 0.0	18.87 0.02	43.9 2.9
17	25.08 0.06	28.4 3.4	37.12 0.12	22.2 0.1	18.85 0.04	41.0 3.0
27	25.14 0.13	25.0 3.5	37.24 0.16	22.3 0.2	18.89 0.08	38.0 3.1
37	25.27	21.5	37.40	22.5	18.97	34.9

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sideral Day of the Month.	β LYRÆ.		ζ AQUILÆ.		δ AQUILÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 18 ^m 45 ^s	[°] 33 ['] 12 ["]	^h 18 ^m 59 ^s	[°] 13 ['] 39 ["]	^h 19 ^m 18 ^s	[°] 2 ['] 50 ["]
Jan. 1	0.44 0.10	22.9 2.8	6.26 0.12	48.6 2.0	35.08 0.10	43.5 1.5
11	0.54 0.15	20.1 2.8	6.38 0.15	46.6 1.9	35.18 0.13	42.0 1.3
21	0.69 0.20	17.3 2.6	6.53 0.17	44.7 1.8	35.31 0.17	40.7 1.0
31	0.89 0.23	14.7 2.3	6.70 0.20	42.9 1.6	35.48 0.19	39.7 1.0
Feb. 10	1.12 0.26	12.4 2.0	6.90 0.23	41.3 1.2	35.67 0.22	38.7 0.8
20	1.38 0.28	10.4 1.4	7.13 0.26	40.1 1.0	35.89 0.24	37.9 0.6
March 2	1.66 0.30	9.0 0.9	7.39 0.27	39.1 0.6	36.13 0.26	37.3 0.3
12	1.96 0.32	8.1 0.4	7.66 0.28	38.5 0.2	36.39 0.27	37.0 0.0
22	2.28 0.32	7.7 0.1	7.94 0.29	38.3 0.3	36.66 0.28	37.0 0.4
April 1	2.60 0.32	7.8 0.7	8.23 0.29	38.6 0.7	36.94 0.29	37.4 0.7
11	2.92 0.31	8.5 1.3	8.52 0.28	39.3 1.1	37.23 0.29	38.1 1.0
21	3.23 0.29	9.8 1.7	8.80 0.27	40.4 1.4	37.52 0.28	39.1 1.3
May 1	3.52 0.28	11.5 2.2	9.07 0.28	41.8 1.7	37.80 0.28	40.4 1.5
11	3.80 0.26	13.7 2.5	9.35 0.26	43.5 2.0	38.08 0.27	41.9 1.6
21	4.06 0.23	16.2 2.7	9.61 0.23	45.5 2.1	38.35 0.25	43.5 1.7
31	4.29 0.19	18.9 2.9	9.84 0.20	47.6 2.2	38.60 0.23	45.2 1.8
June 10	4.48 0.15	21.8 3.0	10.04 0.17	49.8 2.3	38.83 0.19	47.0 1.9
20	4.63 0.11	24.8 3.1	10.21 0.14	52.1 2.3	39.02 0.16	48.9 1.8
30	4.74 0.06	27.9 3.0	10.35 0.09	54.4 2.2	39.18 0.12	50.7 1.7
July 10	4.80 0.01	30.9 2.8	10.44 0.05	56.6 2.0	39.30 0.07	52.4 1.5
20	4.81 0.04	33.7 2.5	10.49 0.00	58.6 1.9	39.37 0.03	53.9 1.4
30	4.77 0.09	36.2 2.3	10.49 0.04	60.5 1.7	39.40 0.01	55.3 1.2
Aug. 9	4.68 0.13	38.5 2.0	10.45 0.08	62.2 1.4	39.39 0.06	56.5 1.1
19	4.55 0.17	40.5 1.7	10.37 0.11	63.6 1.2	39.33 0.09	57.6 0.9
29	4.38 0.20	42.2 1.3	10.26 0.14	64.8 0.9	39.24 0.13	58.5 0.7
Sept. 8	4.18 0.22	43.5 0.9	10.12 0.17	65.7 0.7	39.11 0.15	59.2 0.4
18	3.96 0.22	44.4 0.5	9.95 0.19	66.4 0.3	38.96 0.16	59.6 0.2
28	3.74 0.24	44.9 0.1	9.76 0.19	66.7 0.0	38.80 0.18	59.8 0.0
Oct. 8	3.50 0.23	45.0 0.4	9.57 0.19	66.7 0.2	38.62 0.17	59.8 0.2
18	3.27 0.22	44.6 0.8	9.38 0.17	66.5 0.6	38.45 0.16	59.6 0.3
28	3.05 0.19	43.8 1.3	9.21 0.15	65.9 0.8	38.29 0.15	59.3 0.5
Nov. 7	2.86 0.16	42.5 1.6	9.06 0.12	65.1 1.0	38.14 0.12	58.8 0.8
17	2.70 0.11	40.9 2.0	8.94 0.08	64.1 1.3	38.02 0.08	58.0 1.0
27	2.59 0.07	38.9 2.4	8.86 0.04	62.8 1.6	37.94 0.04	57.0 1.1
Dec. 7	2.52 0.02	36.5 2.6	8.82 0.00	61.2 1.8	37.90 0.01	55.9 1.1
17	2.50 0.03	33.9 2.8	8.82 0.04	59.4 1.9	37.89 0.04	54.8 1.2
27	2.53 0.08	31.1 2.9	8.86 0.08	57.5 2.0	37.93 0.07	53.6 1.3
37	2.61	28.2	8.94	55.5	38.00	52.3

NOTE. — Before the 22d of March the Sideral day of the Month begins at the Sideral Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ AQUILÆ.		α AQUILÆ. (Altair.)		β AQUILÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 19 ^m 39	[°] 10 ['] 16	^h 19 ^m 44	[°] 8 ['] 30	^h 19 ^m 48	[°] 6 ['] 3
Jan. 1	44.41 0.07	59.2 1.6	5.59 0.07	36.8 1.6	34.68 0.06	65.2 1.4
11	44.48 0.11	57.6 1.7	5.66 0.11	35.2 1.5	34.74 0.10	63.8 1.5
21	44.59 0.14	55.9 1.6	5.77 0.14	33.7 1.5	34.84 0.14	62.3 1.3
31	44.73 0.17	54.3 1.4	5.91 0.17	32.2 1.3	34.98 0.17	61.0 1.2
Feb. 10	44.90 0.20	52.9 1.1	6.08 0.19	30.9 1.0	35.15 0.19	59.8 0.9
20	45.10 0.22	51.8 0.9	6.27 0.22	29.9 0.7	35.34 0.21	58.9 0.7
March 2	45.32 0.25	50.9 0.5	6.49 0.25	29.2 0.4	35.55 0.24	58.2 0.4
12	45.57 0.26	50.4 0.1	6.74 0.26	28.8 0.1	35.79 0.26	57.8 0.0
22	45.83 0.28	50.3 0.2	7.00 0.28	28.7 0.2	36.05 0.28	57.8 0.3
April 1	46.11 0.29	50.5 0.6	7.28 0.29	28.9 0.6	36.33 0.29	58.1 0.7
11	46.40 0.29	51.1 1.0	7.57 0.29	29.5 1.0	36.62 0.30	58.8 1.0
21	46.69 0.28	52.1 1.3	7.86 0.29	30.5 1.4	36.92 0.29	59.8 1.2
May 1	46.97 0.29	53.4 1.6	8.15 0.28	31.9 1.6	37.21 0.29	61.0 1.5
11	47.26 0.28	55.0 1.9	8.43 0.28	33.5 1.8	37.50 0.27	62.5 1.8
21	47.54 0.26	56.9 2.1	8.71 0.26	35.3 2.0	37.77 0.26	64.3 1.9
31	47.80 0.24	59.0 2.2	8.97 0.25	37.3 2.1	38.03 0.24	66.2 1.9
June 10	48.04 0.20	61.2 2.1	9.22 0.21	39.4 2.1	38.27 0.22	68.1 2.0
20	48.24 0.17	63.3 2.2	9.43 0.18	41.5 2.2	38.49 0.18	70.1 2.0
30	48.41 0.14	65.5 2.1	9.61 0.14	43.7 2.1	38.67 0.14	72.1 1.9
July 10	48.55 0.09	67.6 2.0	9.75 0.09	45.8 1.9	38.81 0.10	74.0 1.9
20	48.64 0.04	69.6 1.9	9.84 0.05	47.7 1.7	38.91 0.06	75.9 1.7
30	48.68 0.00	71.5 1.7	9.89 0.01	49.4 1.6	38.97 0.02	77.6 1.5
Aug. 9	48.68 0.04	73.2 1.4	9.90 0.04	51.0 1.4	38.99 0.03	79.1 1.2
19	48.64 0.09	74.6 1.2	9.86 0.08	52.4 1.2	38.96 0.08	80.3 1.0
29	48.55 0.12	75.8 1.0	9.78 0.11	53.6 0.9	38.88 0.11	81.3 0.9
Sept. 8	48.43 0.14	76.8 0.7	9.67 0.14	54.5 0.7	38.77 0.14	82.2 0.6
18	48.29 0.17	77.5 0.5	9.53 0.16	55.2 0.5	38.63 0.15	82.8 0.4
28	48.12 0.17	78.0 0.2	9.37 0.17	55.7 0.2	38.48 0.17	83.2 0.1
Oct. 8	47.95 0.18	78.2 0.1	9.20 0.18	55.9 0.1	38.31 0.18	83.3 0.1
18	47.77 0.17	78.1 0.3	9.02 0.17	55.8 0.3	38.13 0.16	83.2 0.3
28	47.60 0.15	77.8 0.6	8.85 0.15	55.5 0.5	37.97 0.16	82.9 0.5
Nov. 7	47.45 0.13	77.2 0.9	8.70 0.13	55.0 0.8	37.81 0.13	82.4 0.8
17	47.32 0.11	76.3 1.1	8.57 0.11	54.2 1.1	37.68 0.10	81.6 1.0
27	47.21 0.07	75.2 1.2	8.46 0.07	53.1 1.2	37.58 0.07	80.6 1.1
Dec. 7	47.14 0.03	74.0 1.4	8.39 0.03	51.9 1.2	37.51 0.03	79.5 1.2
17	47.11 0.01	72.6 1.6	8.36 0.00	50.7 1.5	37.48 0.00	78.3 1.4
27	47.12 0.06	71.0 1.7	8.36 0.05	49.2 1.6	37.48 0.04	76.9 1.5
37	47.18	69.3	8.41	47.6	37.52	75.4

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	λ Ursæ Minoris.			α² CAPRICORN.			α Pavonis.		
	Right Ascension.		Dec. North.	Right Ascension.		Dec. South.	Right Ascension.		Dec. South.
	^h 19		88° 53'	^h ^m 20 10		12° 57'	^h ^m 20 14		57° 9'
Jan. 1	^m 59 42.61	^s 4.41	67.8 3.0	^s 26.85 0.05	^s 59.1 0.3	46.79 0.05	^s 46.79 0.05	^s 72.8 2.4	
11	59 38.20	2.16	64.8 3.1	26.90 0.10	59.4 0.2	46.84 0.13	46.84 0.13	70.4 2.4	
21	59 36.04	0.09	61.7 3.2	27.00 0.13	59.6 0.1	46.97 0.19	46.97 0.19	68.0 2.5	
31	59 36.13	2.34	58.5 3.1	27.13 0.15	59.7 0.0	47.16 0.25	47.16 0.25	65.5 2.5	
Feb. 10	59 38.47	4.49	55.4 2.9	27.28 0.19	59.7 0.1	47.41 0.31	47.41 0.31	63.0 2.4	
20	59 42.96	6.44	52.5 2.6	27.47 0.21	59.6 0.3	47.72 0.35	47.72 0.35	60.6 2.3	
March 2	59 49.40	8.11	49.9 2.2	27.68 0.24	59.3 0.4	48.07 0.39	48.07 0.39	58.3 2.1	
12	59 57.51	9.42	47.7 1.6	27.92 0.26	58.9 0.6	48.46 0.43	48.46 0.43	56.2 1.9	
22	60 6.93	10.37	46.1 1.1	28.18 0.27	58.3 0.9	48.89 0.46	48.89 0.46	54.3 1.8	
April 1	60 17.30	10.88	45.0 0.5	28.45 0.29	57.4 1.1	49.35 0.49	49.35 0.49	52.5 1.5	
11	60 28.18	11.00	44.5 0.1	28.74 0.30	56.3 1.1	49.84 0.50	49.84 0.50	51.0 1.2	
21	60 39.18	10.71	44.6 0.7	29.04 0.30	55.2 1.2	50.34 0.50	50.34 0.50	49.8 0.9	
May 1	60 49.89	10.06	45.3 1.3	29.34 0.31	54.0 1.3	50.84 0.51	50.84 0.51	48.9 0.5	
11	60 59.95	9.08	46.6 1.8	29.65 0.30	52.7 1.3	51.35 0.50	51.35 0.50	48.4 0.2	
21	61 9.03	7.82	48.4 2.3	29.95 0.29	51.4 1.4	51.85 0.48	51.85 0.48	48.2 0.1	
31	61 16.85	6.30	50.7 2.7	30.24 0.27	50.0 1.4	52.33 0.45	52.33 0.45	48.3 0.5	
June 10	61 23.15	4.63	53.4 3.0	30.51 0.25	48.6 1.2	52.78 0.40	52.78 0.40	48.8 0.8	
20	61 27.78	2.84	56.4 3.2	30.76 0.21	47.4 1.1	53.18 0.35	53.18 0.35	49.6 1.1	
30	61 30.62	0.97	59.6 3.4	30.97 0.17	46.3 1.0	53.53 0.29	53.53 0.29	50.7 1.4	
July 10	61 31.59	0.90	63.0 3.4	31.14 0.14	45.3 0.8	53.82 0.21	53.82 0.21	52.1 1.7	
20	61 30.69	2.74	66.4 3.4	31.28 0.09	44.5 0.6	54.03 0.13	54.03 0.13	53.8 1.8	
30	61 27.95	4.53	69.8 3.4	31.37 0.04	43.9 0.4	54.16 0.06	54.16 0.06	55.6 1.9	
Aug. 9	61 23.42	6.22	73.2 3.2	31.41 0.00	43.5 0.3	54.21 0.02	54.21 0.02	57.5 2.0	
19	61 17.20	7.77	76.4 3.0	31.41 0.05	43.2 0.2	54.19 0.10	54.19 0.10	59.5 1.9	
29	61 9.43	9.16	79.4 2.7	31.36 0.09	43.0 0.0	54.09 0.17	54.09 0.17	61.4 1.8	
Sept. 8	61 0.27	10.38	82.1 2.4	31.27 0.12	43.0 0.1	53.92 0.23	53.92 0.23	63.2 1.6	
18	60 49.89	11.38	84.5 1.9	31.15 0.14	43.1 0.1	53.69 0.28	53.69 0.28	64.8 1.4	
28	60 38.51	12.15	86.4 1.5	31.01 0.16	43.2 0.2	53.41 0.31	53.41 0.31	66.2 1.0	
Oct. 8	60 26.36	12.66	87.9 1.0	30.85 0.17	43.4 0.3	53.10 0.33	53.10 0.33	67.2 0.6	
18	60 13.70	12.90	88.9 0.6	30.68 0.17	43.7 0.4	52.77 0.34	52.77 0.34	67.8 0.3	
28	60 0.80	12.84	89.5 0.0	30.51 0.16	44.1 0.3	52.43 0.32	52.43 0.32	68.1 0.2	
Nov. 7	59 47.96	12.44	89.5 0.6	30.35 0.14	44.4 0.3	52.11 0.29	52.11 0.29	67.9 0.7	
17	59 35.52	11.71	88.9 1.0	30.21 0.10	44.7 0.4	51.82 0.24	51.82 0.24	67.2 1.0	
27	59 23.81	10.64	87.9 1.6	30.11 0.07	45.1 0.4	51.58 0.18	51.58 0.18	66.2 1.4	
Dec. 7	59 13.17	9.27	86.3 2.1	30.04 0.04	45.5 0.3	51.40 0.14	51.40 0.14	64.8 1.7	
17	59 3.90	7.59	84.2 2.6	30.00 0.01	45.8 0.3	51.26 0.06	51.26 0.06	63.1 2.0	
27	58 56.31	5.62	81.6 2.9	29.99 0.02	46.1 0.4	51.20 0.01	51.20 0.01	61.1 2.2	
37	58 50.69		78.7	30.01	46.5	51.21	51.21	58.9	

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal 0h. after the Mean Noon ;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Cygni.		δ Cygni.		ϵ Cygni.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	$20^{\text{h}} 36^{\text{m}}$	$44^{\circ} 47'$	$21^{\text{h}} 0^{\text{m}}$	$38^{\circ} 4'$	$21^{\text{h}} 7^{\text{m}}$	$29^{\circ} 39'$
Jan. 1	44.84 0.05	43.9 2.8	44.77 0.04	51.8 2.4	6.04 0.04	71.2 2.2
11	44.79 0.01	41.1 2.9	44.73 0.01	49.4 2.5	6.00 0.00	69.0 2.3
21	44.80 0.06	38.2 2.9	44.72 0.04	46.9 2.6	6.00 0.03	66.7 2.3
31	44.86 0.12	35.3 2.8	44.76 0.10	44.3 2.6	6.03 0.08	64.4 2.3
Feb. 10	44.98 0.16	32.5 2.6	44.86 0.13	41.7 2.4	6.11 0.12	62.1 2.1
20	45.14 0.20	29.9 2.4	44.99 0.17	39.3 2.0	6.23 0.15	60.0 1.8
March 2	45.34 0.25	27.5 2.0	45.16 0.22	37.3 1.7	6.38 0.19	58.2 1.5
12	45.59 0.28	25.5 1.4	45.38 0.26	35.6 1.2	6.57 0.22	56.7 1.0
22	45.87 0.32	24.1 0.8	45.64 0.28	34.4 0.8	6.79 0.26	55.7 0.6
April 1	46.19 0.35	23.3 0.2	45.92 0.31	33.6 0.2	7.05 0.28	55.1 0.1
11	46.54 0.36	23.1 0.3	46.23 0.34	33.4 0.3	7.33 0.30	55.0 0.3
21	46.90 0.37	23.4 0.8	46.57 0.36	33.7 0.9	7.63 0.32	55.3 0.8
May 1	47.27 0.38	24.2 1.4	46.93 0.36	34.6 1.3	7.95 0.33	56.1 1.3
11	47.65 0.36	25.6 1.9	47.29 0.36	35.9 1.8	8.28 0.33	57.4 1.8
21	48.01 0.35	27.5 2.4	47.65 0.35	37.7 2.3	8.61 0.32	59.2 2.2
31	48.36 0.31	29.9 2.7	48.00 0.33	40.0 2.6	8.93 0.30	61.4 2.4
June 10	48.67 0.28	32.6 3.0	48.33 0.29	42.6 3.0	9.23 0.27	63.8 2.7
20	48.95 0.24	35.6 3.3	48.62 0.26	45.6 3.2	9.50 0.25	66.5 2.8
30	49.19 0.19	38.9 3.3	48.88 0.22	48.8 3.3	9.75 0.22	69.3 2.9
July 10	49.38 0.14	42.2 3.4	49.10 0.18	52.1 3.3	9.97 0.17	72.2 3.0
20	49.52 0.07	45.6 3.4	49.28 0.12	55.4 3.2	10.14 0.12	75.2 2.9
30	49.59 0.02	49.0 3.3	49.40 0.07	58.6 3.2	10.26 0.07	78.1 2.8
Aug. 9	49.61 0.04	52.3 3.1	49.47 0.01	61.8 3.0	10.33 0.02	80.9 2.6
19	49.57 0.09	55.4 2.8	49.48 0.04	64.8 2.9	10.35 0.02	83.5 2.5
29	49.48 0.14	58.2 2.5	49.44 0.08	67.7 2.6	10.33 0.07	86.0 2.2
Sept. 8	49.34 0.18	60.7 2.2	49.36 0.12	70.3 2.3	10.26 0.10	88.2 1.9
18	49.16 0.22	62.9 1.9	49.24 0.15	72.6 1.9	10.16 0.14	90.1 1.5
28	48.94 0.24	64.8 1.4	49.09 0.18	74.5 1.5	10.02 0.16	91.6 1.2
Oct. 8	48.70 0.26	66.2 0.9	48.91 0.20	76.0 1.1	9.86 0.18	92.8 0.8
18	48.44 0.26	67.1 0.3	48.71 0.22	77.1 0.5	9.68 0.19	93.6 0.4
28	48.18 0.27	67.4 0.1	48.49 0.22	77.6 0.1	9.49 0.19	94.0 0.0
Nov. 7	47.91 0.25	67.3 0.6	48.27 0.20	77.7 0.3	9.30 0.19	94.0 0.4
17	47.66 0.23	66.7 1.1	48.07 0.19	77.4 0.7	9.11 0.17	93.6 0.8
27	47.43 0.20	65.6 1.5	47.88 0.17	76.7 1.1	8.94 0.15	92.8 1.2
Dec. 7	47.23 0.16	64.1 2.0	47.71 0.14	75.6 1.6	8.79 0.12	91.6 1.5
17	47.07 0.11	62.1 2.3	47.57 0.10	74.0 2.0	8.67 0.09	90.1 1.8
27	46.96 0.08	59.8 2.7	47.47 0.06	72.0 2.3	8.58 0.06	88.3 2.1
37	46.88	57.1	47.41	69.7	8.52	86.2

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	β URSÆ MINORIS.		β LIBRÆ.		α CORONÆ BOREALIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 14 ^m 51	[°] 74 ['] 42	^h 15 ^m 9	[°] 8 ['] 52	^h 15 ^m 28	[°] 27 ['] 10
Jan. 1	5.08 0.78	34.2 2.3	38.58 0.32	31.5 1.6	53.07 0.30	29.7 2.6
11	5.86 0.83	31.9 1.7	38.90 0.32	33.1 1.6	53.37 0.32	27.1 2.2
21	6.69 0.86	30.2 1.0	39.22 0.32	34.7 1.6	53.69 0.32	24.9 1.8
31	7.55 0.89	29.2 0.3	39.54 0.31	36.3 1.4	54.01 0.33	23.1 1.3
Feb. 10	8.44 0.86	28.9 0.3	39.85 0.30	37.7 1.3	54.34 0.32	21.8 0.8
20	9.30 0.80	29.2 1.0	40.15 0.29	39.0 1.0	54.66 0.31	21.0 0.3
March 2	10.10 0.72	30.2 1.6	40.44 0.27	40.0 0.8	54.97 0.27	20.7 0.2
12	10.82 0.62	31.8 2.1	40.71 0.24	40.8 0.6	55.24 0.26	20.9 0.7
22	11.44 0.50	33.9 2.6	40.95 0.21	41.4 0.5	55.50 0.24	21.6 1.1
April 1	11.94 0.37	36.5 3.0	41.16 0.19	41.9 0.2	55.74 0.20	22.7 1.5
11	12.31 0.22	39.5 3.2	41.35 0.16	42.1 0.0	55.94 0.17	24.2 1.9
21	12.53 0.07	42.7 3.3	41.51 0.12	42.1 0.2	56.11 0.13	26.1 2.1
May 1	12.60 0.07	46.0 3.3	41.63 0.10	41.9 0.3	56.24 0.10	28.2 2.3
11	12.53 0.20	49.3 3.1	41.73 0.08	41.6 0.4	56.34 0.07	30.5 2.3
21	12.33 0.33	52.4 2.8	41.81 0.04	41.2 0.6	56.41 0.02	32.8 2.3
31	12.00 0.45	55.2 2.5	41.85 0.01	40.6 0.5	56.43 0.01	35.1 2.2
June 10	11.55 0.55	57.7 2.2	41.86 0.01	40.1 0.5	56.42 0.04	37.3 2.1
20	11.00 0.63	59.9 1.8	41.85 0.04	39.6 0.6	56.38 0.07	39.4 1.9
30	10.37 0.70	61.7 1.3	41.81 0.07	39.0 0.6	56.31 0.10	41.3 1.6
July 10	9.67 0.75	63.0 0.8	41.74 0.10	38.4 0.6	56.21 0.13	42.9 1.3
20	8.92 0.80	63.8 0.2	41.64 0.12	37.8 0.6	56.08 0.16	44.2 1.1
30	8.12 0.81	64.0 0.3	41.52 0.14	37.2 0.5	55.92 0.17	45.3 0.7
Aug. 9	7.31 0.80	63.7 0.8	41.38 0.15	36.7 0.5	55.75 0.18	46.0 0.3
19	6.51 0.80	62.9 1.3	41.23 0.15	36.2 0.5	55.57 0.19	46.3 0.1
29	5.71 0.75	61.6 1.8	41.08 0.15	35.7 0.4	55.38 0.19	46.2 0.4
Sept. 8	4.96 0.69	59.8 2.3	40.93 0.13	35.3 0.2	55.19 0.18	45.8 0.7
18	4.27 0.61	57.5 2.7	40.80 0.11	35.1 0.2	55.01 0.17	45.1 1.1
28	3.66 0.52	54.8 3.0	40.69 0.09	34.9 0.0	54.84 0.14	44.0 1.5
Oct. 8	3.14 0.41	51.8 3.3	40.60 0.05	34.9 0.1	54.70 0.10	42.5 1.8
18	2.73 0.28	48.5 3.6	40.55 0.01	35.0 0.3	54.60 0.06	40.7 2.2
28	2.45 0.14	44.9 3.8	40.54 0.04	35.3 0.5	54.54 0.01	38.5 2.5
Nov. 7	2.31 0.01	41.1 3.7	40.58 0.10	35.8 0.8	54.53 0.05	36.0 2.6
17	2.32 0.18	37.4 3.8	40.68 0.14	36.6 1.0	54.58 0.10	33.4 2.8
27	2.50 0.33	33.6 3.6	40.82 0.19	37.6 1.2	54.68 0.15	30.6 2.9
Dec. 7	2.83 0.47	30.0 3.3	41.01 0.22	38.8 1.3	54.83 0.20	27.7 2.9
17	3.30 0.60	26.7 3.0	41.23 0.27	40.1 1.4	55.03 0.24	24.8 2.9
27	3.90 0.70	23.7 2.6	41.50 0.29	41.5 1.6	55.27 0.28	21.9 2.7
37	4.60	21.1	41.79	43.1	55.55	19.2

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sideral Day of the Month.	α SERPENTIS.		ζ URSAE MINORIS.		β^1 SCORPII.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h 15 ^m 37	[°] 6 ['] 51	^h 15 ^m 48	[°] 78 ['] 12	^h 15 ^m 57	[°] 19 ['] 25
Jan. 1	31.31 0.30	26.7 2.1	55.38 0.78	36.1 2.7	28.65 0.30	37.1 0.9
11	31.61 0.30	24.6 1.9	56.16 0.91	33.4 2.3	28.95 0.32	38.0 1.1
21	31.91 0.30	22.7 1.6	57.07 1.02	31.1 1.7	29.27 0.33	39.1 1.1
31	32.21 0.30	21.1 1.3	58.09 1.08	29.4 1.0	29.60 0.33	40.2 1.1
Feb. 10	32.51 0.30	19.8 1.1	59.17 1.12	28.4 0.4	29.93 0.33	41.3 1.0
20	32.81 0.30	18.7 0.8	60.29 1.08	28.0 0.3	30.26 0.32	42.3 1.0
March 2	33.11 0.27	17.9 0.4	61.37 1.01	28.3 1.0	30.58 0.30	43.3 0.8
12	33.38 0.25	17.5 0.0	62.38 0.94	29.3 1.6	30.88 0.27	44.1 0.8
22	33.63 0.22	17.5 0.4	63.32 0.83	30.9 2.1	31.15 0.26	44.9 0.6
April 1	33.85 0.20	17.9 0.6	64.15 0.68	33.0 2.6	31.41 0.24	45.5 0.5
11	34.05 0.17	18.5 0.9	64.83 0.52	35.6 2.9	31.65 0.21	46.0 0.4
21	34.22 0.15	19.4 1.2	65.35 0.33	38.5 3.1	31.86 0.19	46.4 0.2
May 1	34.37 0.12	20.6 1.3	65.68 0.15	41.6 3.3	32.05 0.16	46.6 0.2
11	34.49 0.09	21.9 1.4	65.83 0.04	44.9 3.3	32.21 0.13	46.8 0.1
21	34.58 0.06	23.3 1.4	65.79 0.22	48.2 3.2	32.34 0.09	46.9 0.1
31	34.64 0.02	24.7 1.4	65.57 0.40	51.4 3.0	32.48 0.06	47.0 0.0
June 10	34.66 0.00	26.1 1.4	65.17 0.56	54.4 2.7	32.49 0.03	47.0 0.1
20	34.66 0.03	27.5 1.2	64.61 0.70	57.1 2.4	32.52 0.01	46.9 0.2
30	34.63 0.06	28.7 1.2	63.91 0.83	59.5 2.0	32.51 0.06	46.7 0.2
July 10	34.57 0.09	29.9 1.0	63.08 0.92	61.5 1.5	32.46 0.08	46.5 0.2
20	34.48 0.12	30.9 0.8	62.16 1.01	63.0 1.0	32.38 0.10	46.3 0.3
30	34.36 0.14	31.7 0.7	61.15 1.08	64.0 0.5	32.28 0.13	46.0 0.3
Aug. 9	34.22 0.16	32.4 0.5	60.07 1.11	64.5 0.1	32.15 0.15	45.7 0.4
19	34.06 0.16	32.9 0.3	58.96 1.13	64.6 0.5	32.00 0.17	45.3 0.4
29	33.90 0.16	33.2 0.0	57.83 1.11	64.1 1.0	31.83 0.17	44.9 0.4
Sept. 8	33.74 0.15	33.2 0.2	56.72 1.08	63.1 1.5	31.66 0.16	44.5 0.5
18	33.59 0.14	33.0 0.4	55.64 1.01	61.6 2.0	31.50 0.15	44.0 0.5
28	33.45 0.12	32.6 0.6	54.63 0.91	59.6 2.4	31.35 0.13	43.5 0.4
Oct. 8	33.33 0.08	32.0 0.9	53.72 0.80	57.2 2.8	31.22 0.09	43.1 0.4
18	33.25 0.03	31.1 1.1	52.92 0.66	54.4 3.2	31.13 0.04	42.7 0.3
28	33.22 0.01	30.0 1.3	52.26 0.50	51.2 3.4	31.09 0.00	42.4 0.2
Nov. 7	33.23 0.05	28.7 1.6	51.76 0.29	47.8 3.6	31.09 0.04	42.2 0.0
17	33.28 0.10	27.1 1.9	51.47 0.09	44.2 3.7	31.13 0.11	42.2 0.2
27	33.38 0.15	25.2 2.0	51.38 0.11	40.5 3.6	31.24 0.16	42.4 0.4
Dec. 7	33.53 0.20	23.2 2.0	51.49 0.31	36.9 3.5	31.40 0.19	42.8 0.5
17	33.73 0.23	21.2 2.1	51.80 0.51	33.4 3.4	31.59 0.24	43.3 0.7
27	33.96 0.25	19.1 2.1	52.31 0.68	30.0 3.0	31.83 0.28	44.0 0.8
37	34.21	17.0	52.99	27.0	32.11	44.8

after the 23d of March it begins at the Sideral Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	δ OPHIUCHI.			α SCORPII. (Antares.)			γ Draconis.		
	Right Ascension.	Dec. South.		Right Ascension.	Dec. South.		Right Ascension.	Dec. North.	
	^h 16	^m 7	[°] 3 20'	^h 16	^m 21	[°] 26 7'	^h 16	^m 22	[°] 61 49'
Jan. 1	10.09	0.27	21.1 1.6	0.77	0.30	26.1 0.6	6.79	0.35	19.1 3.3
11	10.36	0.30	22.7 1.5	1.07	0.32	26.7 0.6	7.14	0.41	15.9 2.7
21	10.66	0.31	24.2 1.4	1.39	0.33	27.3 0.7	7.55	0.47	13.2 2.1
31	10.97	0.30	25.6 1.3	1.72	0.34	28.0 0.8	8.02	0.50	11.1 1.6
Feb. 10	11.27	0.31	26.9 1.1	2.06	0.35	28.8 0.8	8.52	0.51	9.5 1.0
20	11.58	0.30	28.0 0.9	2.41	0.34	29.6 0.8	9.03	0.52	8.5 0.3
March 2	11.88	0.28	28.9 0.5	2.75	0.33	30.4 0.8	9.55	0.50	8.2 0.4
12	12.16	0.27	29.4 0.5	3.08	0.31	31.2 0.7	10.05	0.47	8.6 1.0
22	12.43	0.25	29.9 0.2	3.39	0.28	31.9 0.7	10.52	0.44	9.6 1.6
April 1	12.68	0.23	29.7 0.2	3.67	0.27	32.6 0.6	10.96	0.37	11.2 2.2
11	12.91	0.20	29.5 0.4	3.94	0.24	33.2 0.6	11.33	0.32	13.4 2.6
21	13.11	0.18	29.1 0.7	4.18	0.21	33.8 0.5	11.65	0.26	16.0 3.0
May 1	13.29	0.15	28.4 0.8	4.39	0.18	34.3 0.5	11.91	0.19	19.0 3.2
11	13.44	0.12	27.6 0.8	4.57	0.16	34.8 0.4	12.10	0.11	22.2 3.3
21	13.56	0.09	26.8 1.0	4.73	0.13	35.2 0.3	12.21	0.02	25.5 3.3
31	13.65	0.06	25.8 1.0	4.86	0.09	35.5 0.3	12.23	0.05	28.8 3.2
June 10	13.71	0.03	24.8 1.0	4.95	0.05	35.8 0.3	12.18	0.12	32.0 3.1
20	13.74	0.00	23.8 0.9	5.00	0.02	36.1 0.2	12.06	0.18	35.1 2.8
30	13.74	0.04	22.9 0.8	5.02	0.02	36.3 0.2	11.88	0.25	37.9 2.5
July 10	13.70	0.07	22.1 0.8	5.00	0.07	36.5 0.1	11.63	0.31	40.4 2.1
20	13.63	0.10	21.3 0.7	4.93	0.10	36.6 0.0	11.32	0.36	42.5 1.7
30	13.53	0.13	20.6 0.6	4.83	0.13	36.6 0.1	10.96	0.40	44.2 1.2
Aug. 9	13.40	0.15	20.0 0.5	4.70	0.15	36.5 0.2	10.56	0.43	45.4 0.7
19	13.25	0.16	19.5 0.4	4.55	0.18	36.3 0.3	10.13	0.46	46.1 0.2
29	13.09	0.16	19.1 0.3	4.37	0.18	36.0 0.4	9.67	0.46	46.3 0.4
Sept. 8	12.93	0.16	18.8 0.1	4.19	0.18	35.6 0.5	9.21	0.46	45.9 0.8
18	12.77	0.15	18.7 0.0	4.01	0.17	35.1 0.6	8.75	0.44	45.1 1.4
28	12.62	0.13	18.7 0.2	3.84	0.15	34.5 0.7	8.31	0.40	43.7 1.9
Oct. 8	12.49	0.10	18.9 0.4	3.69	0.12	33.8 0.6	7.91	0.35	41.8 2.3
18	12.39	0.06	19.3 0.5	3.57	0.07	33.2 0.6	7.56	0.30	39.5 2.7
28	12.33	0.01	19.8 0.7	3.50	0.02	32.6 0.5	7.26	0.22	36.8 2.9
Nov. 7	12.32	0.03	20.5 0.9	3.48	0.03	32.1 0.4	7.04	0.15	33.9 3.3
17	12.35	0.07	21.4 1.1	3.51	0.08	31.7 0.4	6.89	0.05	30.6 3.7
27	12.42	0.13	22.5 1.3	3.59	0.13	31.3 0.2	6.84	0.05	26.9 3.8
Dec. 7	12.55	0.18	23.8 1.5	3.72	0.19	31.1 0.1	6.89	0.14	23.1 3.7
17	12.73	0.22	25.3 1.5	3.91	0.24	31.2 0.2	7.03	0.22	19.4 3.5
27	12.95	0.25	26.8 1.6	4.15	0.26	31.4 0.4	7.25	0.31	15.9 3.2
37	13.20		28.4	4.41		31.8	7.56		12.7

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon ;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sideral Day of the Month.	α Trianguli Australis.		ε Ursæ Minoris.		α HERCULIS.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 16 ^m 34	68° 45'	^h 16 ^m 59	82° 15'	^h 17 ^m 8	14° 32'
Jan. 1	10.79 0.61	62.9 1.7	56.13 0.69	17.6 3.2	23.71 0.22	53.9 2.2
11	11.40 0.68	61.2 1.2	56.82 0.96	14.4 2.8	23.93 0.25	51.7 2.1
21	12.08 0.73	60.0 0.8	57.78 1.21	11.6 2.3	24.18 0.26	49.6 1.9
31	12.81 0.76	59.2 0.4	58.99 1.40	9.3 1.9	24.44 0.28	47.7 1.6
Feb. 10	13.57 0.77	58.8 0.0	60.39 1.54	7.4 1.3	24.72 0.30	46.1 1.2
20	14.34 0.78	58.8 0.4	61.93 1.60	6.1 0.6	25.02 0.29	44.9 0.8
March 2	15.12 0.76	59.2 0.8	63.53 1.62	5.5 0.0	25.31 0.30	44.1 0.3
12	15.88 0.72	60.0 1.1	65.15 1.57	5.5 0.7	25.61 0.27	43.8 0.1
22	16.60 0.69	61.1 1.5	66.72 1.47	6.2 1.4	25.88 0.28	43.9 0.4
April 1	17.29 0.64	62.6 1.8	68.19 1.34	7.6 1.9	26.16 0.26	44.3 0.9
11	17.93 0.58	64.4 2.1	69.53 1.14	9.5 2.4	26.42 0.25	45.2 1.3
21	18.51 0.52	66.5 2.2	70.67 0.90	11.9 2.7	26.67 0.22	46.5 1.6
May 1	19.03 0.43	68.7 2.4	71.57 0.64	14.6 3.0	26.89 0.19	48.1 1.8
11	19.46 0.35	71.1 2.5	72.21 0.37	17.6 3.3	27.08 0.17	49.9 2.0
21	19.81 0.26	73.6 2.5	72.58 0.08	20.9 3.3	27.25 0.14	51.9 2.0
31	20.07 0.17	76.1 2.5	72.66 0.22	24.2 3.2	27.39 0.10	53.9 2.0
June 10	20.24 0.07	78.6 2.5	72.44 0.48	27.4 3.2	27.49 0.07	55.9 2.0
20	20.31 0.03	81.1 2.3	71.96 0.73	30.6 3.0	27.56 0.03	57.9 2.0
30	20.28 0.13	83.4 2.1	71.23 0.98	33.6 2.7	27.59 0.01	59.9 1.8
July 10	20.15 0.23	85.5 1.9	70.25 1.19	36.3 2.4	27.58 0.03	61.7 1.6
20	19.92 0.32	87.4 1.5	69.06 1.37	38.7 2.0	27.53 0.08	63.3 1.5
30	19.60 0.38	88.9 1.1	67.69 1.54	40.7 1.5	27.45 0.12	64.8 1.2
Aug. 9	19.22 0.45	90.0 0.8	66.15 1.66	42.2 1.1	27.33 0.15	66.0 0.9
19	18.77 0.50	90.8 0.3	64.49 1.75	43.3 0.6	27.18 0.17	66.9 0.7
29	18.27 0.50	91.1 0.2	62.74 1.81	43.9 0.1	27.01 0.18	67.6 0.4
Sept. 8	17.77 0.51	90.9 0.7	60.93 1.82	44.0 0.5	26.83 0.18	68.0 0.1
18	17.26 0.49	90.2 1.2	59.11 1.80	43.5 1.0	26.65 0.19	68.1 0.2
28	16.77 0.43	89.0 1.6	57.31 1.71	42.5 1.5	26.46 0.18	67.9 0.5
Oct. 8	16.34 0.36	87.4 1.9	55.60 1.58	41.0 1.8	26.28 0.15	67.4 0.8
18	15.98 0.26	85.5 2.2	54.02 1.44	39.2 2.2	26.13 0.12	66.6 1.1
28	15.72 0.16	83.3 2.5	52.58 1.23	37.0 2.7	26.01 0.08	65.5 1.4
Nov. 7	15.56 0.03	80.8 2.6	51.35 0.99	34.3 3.1	25.93 0.04	64.1 1.7
17	15.53 0.09	78.2 2.7	50.36 0.73	31.2 3.2	25.89 0.00	62.4 1.9
27	15.62 0.21	75.5 2.6	49.63 0.43	28.0 3.5	25.89 0.06	60.5 2.1
Dec. 7	15.83 0.34	72.9 2.4	49.20 0.10	24.5 3.5	25.94 0.10	58.4 2.3
17	16.17 0.45	70.5 2.1	49.10 0.23	21.0 3.5	26.04 0.15	56.1 2.3
27	16.62 0.55	68.4 1.8	49.33 0.53	17.5 3.3	26.19 0.19	53.8 1.2
37	17.17	66.6	49.86	14.2	26.38	51.6

after the 23d of March it begins at the Sideral Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β DRACONIS.		α OPHIUCHI.		σ OCTANTIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h 17 ^m 27	[°] 52 ['] 23	^h 17 ^m 28	[°] 12 ['] 39	^h 17	[°] 89 ['] 16
Jan. 1	18.62 0.21	70.3 3.4	34.17 0.20	44.0 2.2	52 30.06 9.80	35.6 3.1
11	18.83 0.26	66.9 3.1	34.37 0.23	41.8 2.1	52 39.86 12.65	32.5 2.8
21	19.09 0.32	63.8 2.7	34.60 0.25	39.7 1.8	52 52.51 15.11	29.7 2.4
31	19.41 0.36	61.1 2.2	34.85 0.27	37.9 1.4	53 7.62 17.15	27.3 2.0
Feb. 10	19.77 0.38	58.9 1.6	35.12 0.28	36.5 1.2	53 24.77 18.73	25.3 1.5
20	20.15 0.41	57.3 1.1	35.40 0.29	35.3 0.9	53 43.50 19.83	23.8 1.1
March 2	20.56 0.42	56.2 0.4	35.69 0.29	34.4 0.4	54 3.33 20.47	22.7 0.6
12	20.98 0.41	55.8 0.2	35.98 0.29	34.0 0.0	54 23.80 20.62	22.1 0.2
22	21.39 0.39	56.0 0.9	36.27 0.29	34.0 0.4	54 44.42 20.33	21.9 0.4
April 1	21.78 0.36	56.9 1.5	36.56 0.27	34.4 0.9	55 4.75 19.64	22.3 0.9
11	22.14 0.34	58.4 2.0	36.83 0.25	35.3 1.2	55 24.39 18.52	23.2 1.3
21	22.48 0.30	60.4 2.5	37.08 0.23	36.5 1.4	55 42.91 17.01	24.5 1.6
May 1	22.78 0.25	62.9 2.8	37.31 0.21	37.9 1.7	55 59.92 15.16	26.1 2.0
11	23.03 0.21	65.7 3.1	37.52 0.19	39.6 1.9	56 15.08 13.00	28.1 2.4
21	23.24 0.15	68.8 3.3	37.71 0.16	41.5 2.0	56 28.08 10.56	30.5 2.7
31	23.39 0.09	72.1 3.3	37.87 0.12	43.5 2.0	56 38.64 7.87	33.2 2.9
June 10	23.48 0.03	75.4 3.3	37.99 0.09	45.5 2.0	56 46.51 5.01	36.1 3.0
20	23.51 0.03	78.7 3.2	38.08 0.05	47.5 2.0	56 51.52 2.04	39.1 3.0
30	23.48 0.09	81.9 3.0	38.13 0.01	49.5 1.9	56 53.56 1.01	42.1 3.0
July 10	23.39 0.14	84.9 2.8	38.14 0.03	51.4 1.6	56 52.55 3.98	45.1 2.9
20	23.25 0.20	87.7 2.4	38.11 0.07	53.0 1.4	56 48.57 6.83	48.0 2.6
30	23.05 0.25	90.1 2.0	38.04 0.10	54.4 1.2	56 41.74 9.49	50.6 2.3
Aug. 9	22.80 0.29	92.1 1.6	37.94 0.14	55.6 1.0	56 32.25 11.85	52.9 2.0
19	22.51 0.31	93.7 1.0	37.80 0.16	56.6 0.8	56 20.40 13.80	54.9 1.6
29	22.20 0.34	94.7 0.6	37.64 0.17	57.4 0.5	56 6.60 15.29	56.5 1.0
Sept. 8	21.86 0.35	95.3 0.1	37.47 0.19	57.9 0.2	55 51.31 16.22	57.5 0.4
18	21.51 0.36	95.4 0.3	37.28 0.19	58.1 0.2	55 35.09 16.56	57.9 0.2
28	21.15 0.34	95.1 0.9	37.09 0.18	57.9 0.4	55 18.53 16.22	57.7 0.8
Oct. 8	20.81 0.32	94.2 1.4	36.91 0.16	57.5 0.7	55 2.31 15.25	56.9 1.4
18	20.49 0.28	92.8 1.9	36.75 0.13	56.8 0.9	54 47.06 13.67	55.5 1.9
28	20.21 0.23	90.9 2.3	36.62 0.10	55.9 1.1	54 33.39 11.52	53.6 2.3
Nov. 7	19.98 0.18	88.6 2.7	36.52 0.05	54.8 1.5	54 21.87 8.86	51.3 2.8
17	19.80 0.12	85.9 3.0	36.47 0.01	53.3 1.8	54 13.01 5.84	48.5 3.2
27	19.68 0.05	82.9 3.4	36.46 0.03	51.5 2.0	54 7.17 2.53	45.3 3.4
Dec. 7	19.63 0.03	79.5 3.4	36.49 0.08	49.5 2.1	54 4.64 0.91	41.9 3.4
17	19.66 0.11	76.1 3.5	36.57 0.14	47.4 2.1	54 5.55 4.29	38.5 3.2
27	19.77 0.17	72.6 3.5	36.71 0.17	45.3 2.2	54 9.84 7.61	35.3 3.2
37	19.94	69.1	36.88	43.1	54 17.45	32.1

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Ob. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ DRACONIS.		μ^1 Sagittarii.		α LYRÆ. (Vega.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h ^m 17 53	51° 30'	^h ^m 18 5	21° 5'	^h ^m 18 32	38° 39'
Jan. 1	23.89 0.18	20.5 3.4	33.92 0.19	25.7 0.2	16.98 0.12	30.4 3.2
11	24.07 0.23	17.1 3.2	34.11 0.23	25.9 0.1	17.10 0.17	27.2 2.9
21	24.30 0.28	13.9 2.8	34.34 0.25	26.0 0.2	17.27 0.21	24.3 2.7
31	24.58 0.33	11.1 2.4	34.59 0.28	26.2 0.3	17.48 0.25	21.6 2.4
Feb. 10	24.91 0.36	8.7 1.9	34.87 0.30	26.4 0.1	17.73 0.28	19.2 2.0
20	25.27 0.38	6.8 1.3	35.17 0.31	26.5 0.1	18.01 0.30	17.2 1.4
March 2	25.65 0.40	5.5 0.7	35.48 0.31	26.6 0.0	18.31 0.32	15.8 1.0
12	26.05 0.40	4.8 0.0	35.79 0.32	26.6 0.1	18.63 0.34	14.8 0.3
22	26.45 0.40	4.8 0.5	36.11 0.31	26.5 0.2	18.97 0.34	14.5 0.3
April 1	26.85 0.38	5.3 1.2	36.42 0.31	26.3 0.3	19.31 0.34	14.8 0.8
11	27.23 0.35	6.5 1.8	36.73 0.30	26.0 0.3	19.65 0.32	15.6 1.4
21	27.58 0.32	8.3 2.4	37.03 0.29	25.7 0.3	19.97 0.30	17.0 2.0
May 1	27.90 0.29	10.7 2.7	37.32 0.26	25.4 0.4	20.27 0.28	19.0 2.4
11	28.19 0.24	13.4 3.0	37.58 0.24	25.0 0.4	20.55 0.26	21.4 2.6
21	28.43 0.18	16.4 3.3	37.82 0.22	24.6 0.4	20.81 0.22	24.0 2.8
31	28.61 0.13	19.7 3.3	38.04 0.19	24.2 0.3	21.03 0.18	26.8 3.1
June 10	28.74 0.08	23.0 3.3	38.23 0.15	23.9 0.3	21.21 0.14	29.9 3.1
20	28.82 0.01	26.3 3.3	38.38 0.12	23.6 0.2	21.35 0.08	33.0 3.2
30	28.83 0.05	29.6 3.2	38.50 0.07	23.4 0.2	21.43 0.03	36.2 3.1
July 10	28.78 0.11	32.8 2.9	38.57 0.02	23.2 0.1	21.46 0.02	39.3 2.9
20	28.67 0.16	35.7 2.6	38.59 0.03	23.1 0.0	21.44 0.06	42.2 2.7
30	28.51 0.22	38.3 2.3	38.56 0.07	23.1 0.0	21.38 0.11	44.9 2.4
Aug. 9	28.29 0.26	40.6 1.9	38.49 0.10	23.1 0.0	21.27 0.16	47.3 2.1
19	28.03 0.30	42.5 1.4	38.39 0.14	23.1 0.0	21.11 0.20	49.4 1.6
29	27.73 0.32	43.9 0.9	38.25 0.16	23.1 0.0	20.91 0.22	51.0 1.3
Sept. 8	27.41 0.34	44.8 0.5	38.09 0.18	23.1 0.0	20.69 0.25	52.3 0.9
18	27.07 0.35	45.3 0.1	37.91 0.19	23.1 0.0	20.44 0.25	53.2 0.4
28	26.72 0.34	45.2 0.6	37.72 0.19	23.1 0.1	20.19 0.26	53.6 0.1
Oct. 8	26.38 0.32	44.6 1.1	37.53 0.17	23.0 0.2	19.93 0.25	53.5 0.5
18	26.06 0.30	43.5 1.4	37.36 0.14	22.8 0.1	19.68 0.24	53.0 1.0
28	25.76 0.25	42.1 2.0	37.22 0.11	22.7 0.2	19.44 0.20	52.0 1.4
Nov. 7	25.51 0.20	40.1 2.5	37.11 0.06	22.5 0.1	19.24 0.17	50.6 1.9
17	25.31 0.15	37.6 2.8	37.05 0.02	22.4 0.1	19.07 0.12	48.7 2.2
27	25.16 0.08	34.8 3.1	37.03 0.03	22.3 0.1	18.95 0.08	46.5 2.6
Dec. 7	25.08 0.00	31.7 3.3	37.06 0.06	22.2 0.0	18.87 0.02	43.9 2.9
17	25.08 0.06	28.4 3.4	37.12 0.12	22.2 0.1	18.85 0.04	41.0 3.0
27	25.14 0.13	25.0 3.5	37.24 0.16	22.3 0.2	18.89 0.08	38.0 3.1
37	25.27	21.5	37.40	22.5	18.97	34.9

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β LYRE.		ζ AQUILE.		δ AQUILE.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 18 ^m 45	[°] 33 ['] 12	^h 18 ^m 59	[°] 13 ['] 39	^h 19 ^m 18	[°] 2 ['] 50
Jan. 1	0.44 0.10	22.9 2.8	6.26 0.12	48.6 2.0	35.08 0.10	43.5 1.5
11	0.54 0.15	20.1 2.8	6.38 0.15	46.6 1.9	35.18 0.13	42.0 1.3
21	0.69 0.20	17.3 2.6	6.53 0.17	44.7 1.8	35.31 0.17	40.7 1.0
31	0.89 0.23	14.7 2.3	6.70 0.20	42.9 1.6	35.48 0.19	39.7 1.0
Feb. 10	1.12 0.26	12.4 2.0	6.90 0.23	41.3 1.2	35.67 0.22	38.7 0.8
20	1.38 0.28	10.4 1.4	7.13 0.26	40.1 1.0	35.89 0.24	37.9 0.6
March 2	1.66 0.30	9.0 0.9	7.39 0.27	39.1 0.6	36.13 0.26	37.3 0.3
12	1.96 0.32	8.1 0.4	7.66 0.28	38.5 0.2	36.39 0.27	37.0 0.0
22	2.28 0.32	7.7 0.1	7.94 0.29	38.3 0.3	36.66 0.28	37.0 0.4
April 1	2.60 0.32	7.8 0.7	8.23 0.29	38.6 0.7	36.94 0.29	37.4 0.7
11	2.92 0.31	8.5 1.3	8.52 0.28	39.3 1.1	37.23 0.29	38.1 1.0
21	3.23 0.29	9.8 1.7	8.80 0.27	40.4 1.4	37.52 0.28	39.1 1.3
May 1	3.52 0.28	11.5 2.2	9.07 0.28	41.8 1.7	37.80 0.28	40.4 1.5
11	3.80 0.26	13.7 2.5	9.35 0.26	43.5 2.0	38.08 0.27	41.9 1.6
21	4.06 0.23	16.2 2.7	9.61 0.23	45.5 2.1	38.35 0.25	43.5 1.7
31	4.29 0.19	18.9 2.9	9.84 0.20	47.6 2.2	38.60 0.23	45.2 1.8
June 10	4.48 0.15	21.8 3.0	10.04 0.17	49.8 2.3	38.83 0.19	47.0 1.9
20	4.63 0.11	24.8 3.1	10.21 0.14	52.1 2.3	39.02 0.16	48.9 1.8
30	4.74 0.06	27.9 3.0	10.35 0.09	54.4 2.2	39.18 0.12	50.7 1.7
July 10	4.80 0.01	30.9 2.8	10.44 0.05	56.6 2.0	39.30 0.07	52.4 1.5
20	4.81 0.04	33.7 2.5	10.49 0.00	58.6 1.9	39.37 0.03	53.9 1.4
30	4.77 0.09	36.2 2.3	10.49 0.04	60.5 1.7	39.40 0.01	55.3 1.2
Aug. 9	4.68 0.13	38.5 2.0	10.45 0.08	62.2 1.4	39.39 0.06	56.5 1.1
19	4.55 0.17	40.5 1.7	10.37 0.11	63.6 1.2	39.33 0.09	57.6 0.9
29	4.38 0.20	42.2 1.3	10.26 0.14	64.8 0.9	39.24 0.13	58.5 0.7
Sept. 8	4.18 0.22	43.5 0.9	10.12 0.17	65.7 0.7	39.11 0.15	59.2 0.4
18	3.96 0.22	44.4 0.5	9.95 0.19	66.4 0.3	38.96 0.16	59.6 0.2
28	3.74 0.24	44.9 0.1	9.76 0.19	66.7 0.0	38.80 0.18	59.8 0.0
Oct. 8	3.50 0.23	45.0 0.4	9.57 0.19	66.7 0.2	38.62 0.17	59.8 0.2
18	3.27 0.22	44.6 0.8	9.38 0.17	66.5 0.6	38.45 0.16	59.6 0.3
28	3.05 0.19	43.8 1.3	9.21 0.15	65.9 0.8	38.29 0.15	59.3 0.5
Nov. 7	2.86 0.16	42.5 1.6	9.06 0.12	65.1 1.0	38.14 0.12	58.8 0.8
17	2.70 0.11	40.9 2.0	8.94 0.08	64.1 1.3	38.02 0.08	58.0 1.0
27	2.59 0.07	38.9 2.4	8.86 0.04	62.8 1.6	37.94 0.04	57.0 1.1
Dec. 7	2.52 0.02	36.5 2.6	8.82 0.00	61.2 1.8	37.90 0.01	55.9 1.1
17	2.50 0.03	33.9 2.8	8.82 0.04	59.4 1.9	37.89 0.04	54.8 1.2
27	2.53 0.08	31.1 2.9	8.86 0.08	57.5 2.0	37.93 0.07	53.6 1.3
37	2.61	28.2	8.94	55.5	38.00	52.3

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal 0h. after the Mean Noon ;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ AQUILÆ.		α AQUILÆ. (Akhair.)		β AQUILÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 19 39	[°] 10 16	^h 19 44	[°] 8 30	^h 19 48	[°] 6 3
Jan. 1	44.41 0.07	59.2 1.6	5.59 0.07	36.8 1.6	34.68 0.06	65.2 1.4
11	44.48 0.11	57.6 1.7	5.66 0.11	35.2 1.5	34.74 0.10	63.8 1.5
21	44.59 0.14	55.9 1.6	5.77 0.14	33.7 1.5	34.84 0.14	62.3 1.3
31	44.73 0.17	54.3 1.4	5.91 0.17	32.2 1.3	34.98 0.17	61.0 1.2
Feb. 10	44.90 0.20	52.9 1.1	6.06 0.19	30.9 1.0	35.15 0.19	59.8 0.9
20	45.10 0.22	51.8 0.9	6.27 0.22	29.9 0.7	35.34 0.21	58.9 0.7
March 2	45.32 0.25	50.9 0.5	6.49 0.25	29.2 0.4	35.55 0.24	58.2 0.4
12	45.57 0.26	50.4 0.1	6.74 0.26	28.8 0.1	35.79 0.26	57.8 0.0
22	45.83 0.28	50.3 0.2	7.00 0.28	28.7 0.2	36.05 0.28	57.8 0.3
April 1	46.11 0.29	50.5 0.6	7.28 0.29	28.9 0.6	36.33 0.29	58.1 0.7
11	46.40 0.29	51.1 1.0	7.57 0.29	29.5 1.0	36.62 0.30	58.8 1.0
21	46.69 0.28	52.1 1.3	7.86 0.29	30.5 1.4	36.92 0.29	59.8 1.2
May 1	46.97 0.29	53.4 1.6	8.15 0.28	31.9 1.6	37.21 0.29	61.0 1.5
11	47.26 0.28	55.0 1.9	8.43 0.28	33.5 1.8	37.50 0.27	62.5 1.8
21	47.54 0.26	56.9 2.1	8.71 0.26	35.3 2.0	37.77 0.26	64.3 1.9
31	47.80 0.24	59.0 2.2	8.97 0.25	37.3 2.1	38.03 0.24	66.2 1.9
June 10	48.04 0.20	61.2 2.1	9.22 0.21	39.4 2.1	38.27 0.22	68.1 2.0
20	48.24 0.17	63.3 2.2	9.43 0.18	41.5 2.2	38.49 0.18	70.1 2.0
30	48.41 0.14	65.5 2.1	9.61 0.14	43.7 2.1	38.67 0.14	72.1 1.9
July 10	48.55 0.09	67.6 2.0	9.75 0.09	45.8 1.9	38.81 0.10	74.0 1.9
20	48.64 0.04	69.6 1.9	9.84 0.05	47.7 1.7	38.91 0.06	75.9 1.7
30	48.68 0.00	71.5 1.7	9.89 0.01	49.4 1.6	38.97 0.02	77.6 1.5
Aug. 9	48.68 0.04	73.2 1.4	9.90 0.04	51.0 1.4	38.99 0.03	79.1 1.2
19	48.64 0.09	74.6 1.2	9.86 0.08	52.4 1.2	38.96 0.08	80.3 1.0
29	48.55 0.12	75.8 1.0	9.78 0.11	53.6 0.9	38.88 0.11	81.3 0.9
Sept. 8	48.43 0.14	76.8 0.7	9.67 0.14	54.5 0.7	38.77 0.14	82.2 0.6
18	48.29 0.17	77.5 0.5	9.53 0.16	55.2 0.5	38.63 0.15	82.8 0.4
28	48.12 0.17	78.0 0.2	9.37 0.17	55.7 0.2	38.48 0.17	83.2 0.1
Oct. 8	47.95 0.18	78.2 0.1	9.20 0.18	55.9 0.1	38.31 0.18	83.3 0.1
18	47.77 0.17	78.1 0.3	9.02 0.17	55.8 0.3	38.13 0.16	83.2 0.3
28	47.60 0.15	77.8 0.6	8.85 0.15	55.5 0.5	37.97 0.16	82.9 0.5
Nov. 7	47.45 0.13	77.2 0.9	8.70 0.13	55.0 0.8	37.81 0.13	82.4 0.8
17	47.32 0.11	76.3 1.1	8.57 0.11	54.2 1.1	37.68 0.10	81.6 1.0
27	47.21 0.07	75.2 1.2	8.46 0.07	53.1 1.2	37.58 0.07	80.6 1.1
Dec. 7	47.14 0.03	74.0 1.4	8.39 0.03	51.9 1.2	37.51 0.03	79.5 1.2
17	47.11 0.01	72.6 1.6	8.36 0.00	50.7 1.5	37.48 0.00	78.3 1.4
27	47.12 0.06	71.0 1.7	8.36 0.05	49.2 1.6	37.48 0.04	76.9 1.5
37	47.18	69.3	8.41	47.6	37.52	75.4

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	λ URSÆ MINORIS.			α^2 CAPRICORNI.			α PAVONIS.		
	Right Ascension.		Dec. North.	Right Ascension.		Dec. South.	Right Ascension.		Dec. South.
	^h 19		88° 53'	^h 20 ^m 10		12° 57'	^h 20 ^m 14		57° 9'
Jan. 1	^m 59 42.61	^s 4.41	67.8 3.0	^s 26.85 0.05	^s 59.1 0.3	46.79 0.05	^s 72.8 2.4		
11	59 38.20	2.16	64.8 3.1	26.90 0.10	59.4 0.2	46.84 0.13	70.4 2.4		
21	59 36.04	0.09	61.7 3.2	27.00 0.13	59.6 0.1	46.97 0.19	68.0 2.5		
31	59 36.13	2.34	58.5 3.1	27.13 0.15	59.7 0.0	47.16 0.25	65.5 2.5		
Feb. 10	59 38.47	4.49	55.4 2.9	27.28 0.19	59.7 0.1	47.41 0.31	63.0 2.4		
20	59 42.96	6.44	52.5 2.6	27.47 0.21	59.6 0.3	47.72 0.35	60.6 2.3		
March 2	59 49.40	8.11	49.9 2.2	27.68 0.24	59.3 0.4	48.07 0.39	58.3 2.1		
12	59 57.51	9.42	47.7 1.6	27.92 0.26	58.9 0.6	48.46 0.43	56.2 1.9		
22	60 6.93	10.37	46.1 1.1	28.18 0.27	58.3 0.9	48.89 0.46	54.3 1.8		
April 1	60 17.30	10.88	45.0 0.5	28.45 0.29	57.4 1.1	49.35 0.49	52.5 1.5		
11	60 28.18	11.00	44.5 0.1	28.74 0.30	56.3 1.1	49.84 0.50	51.0 1.2		
21	60 39.18	10.71	44.6 0.7	29.04 0.30	55.2 1.2	50.34 0.50	49.8 0.9		
May 1	60 49.89	10.06	45.3 1.3	29.34 0.31	54.0 1.3	50.84 0.51	48.9 0.5		
11	60 59.95	9.08	46.6 1.8	29.65 0.30	52.7 1.3	51.35 0.50	48.4 0.2		
21	61 9.03	7.82	48.4 2.3	29.95 0.29	51.4 1.4	51.85 0.48	48.2 0.1		
31	61 16.85	6.30	50.7 2.7	30.24 0.27	50.0 1.4	52.33 0.45	48.3 0.5		
June 10	61 23.15	4.63	53.4 3.0	30.51 0.25	48.6 1.2	52.78 0.40	48.8 0.8		
20	61 27.78	2.84	56.4 3.2	30.76 0.21	47.4 1.1	53.18 0.35	49.6 1.1		
30	61 30.62	0.97	59.6 3.4	30.97 0.17	46.3 1.0	53.53 0.29	50.7 1.4		
July 10	61 31.59	0.90	63.0 3.4	31.14 0.14	45.3 0.8	53.82 0.21	52.1 1.7		
20	61 30.69	2.74	66.4 3.4	31.28 0.09	44.5 0.6	54.03 0.13	53.8 1.8		
30	61 27.95	4.53	69.8 3.4	31.37 0.04	43.9 0.4	54.16 0.06	55.6 1.9		
Aug. 9	61 23.42	6.22	73.2 3.2	31.41 0.00	43.5 0.3	54.21 0.02	57.5 2.0		
19	61 17.20	7.77	76.4 3.0	31.41 0.05	43.2 0.2	54.19 0.10	59.5 1.9		
29	61 9.43	9.16	79.4 2.7	31.36 0.09	43.0 0.0	54.09 0.17	61.4 1.8		
Sept. 8	61 0.27	10.38	82.1 2.4	31.27 0.12	43.0 0.1	53.92 0.23	63.2 1.6		
18	60 49.89	11.38	84.5 1.9	31.15 0.14	43.1 0.1	53.69 0.28	64.8 1.4		
28	60 38.51	12.15	86.4 1.5	31.01 0.16	43.2 0.2	53.41 0.31	66.2 1.0		
Oct. 8	60 26.36	12.66	87.9 1.0	30.85 0.17	43.4 0.3	53.10 0.33	67.2 0.6		
18	60 13.70	12.90	88.9 0.6	30.68 0.17	43.7 0.4	52.77 0.34	67.8 0.3		
28	60 0.80	12.84	89.5 0.0	30.51 0.16	44.1 0.3	52.43 0.32	68.1 0.2		
Nov. 7	59 47.96	12.44	89.5 0.6	30.35 0.14	44.4 0.3	52.11 0.29	67.9 0.7		
17	59 35.52	11.71	88.9 1.0	30.21 0.10	44.7 0.4	51.82 0.24	67.2 1.0		
27	59 23.81	10.64	87.9 1.6	30.11 0.07	45.1 0.4	51.58 0.18	66.2 1.4		
Dec. 7	59 13.17	9.27	86.3 2.1	30.04 0.04	45.5 0.3	51.40 0.14	64.8 1.7		
17	59 3.90	7.59	84.2 2.6	30.00 0.01	45.8 0.3	51.26 0.06	63.1 2.0		
27	58 56.31	5.62	81.6 2.9	29.99 0.02	46.1 0.4	51.20 0.01	61.1 2.2		
37	58 50.69		78.7	30.01	46.5	51.21	58.9		

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon ;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α CYGNI.		61 ¹ CYGNI.		ζ Cygni.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 20 ^m 36	[°] 44 ['] 47	^h 21 ^m 0	[°] 38 ['] 4	^h 21 ^m 7	[°] 29 ['] 39
Jan. 1	44.84 0.05	43.9 2.8	44.77 0.04	51.8 2.4	6.04 0.04	71.2 2.2
11	44.79 0.01	41.1 2.9	44.73 0.01	49.4 2.5	6.00 0.00	69.0 2.3
21	44.80 0.06	38.2 2.9	44.72 0.04	46.9 2.6	6.00 0.03	66.7 2.3
31	44.86 0.12	35.3 2.8	44.76 0.10	44.3 2.6	6.03 0.08	64.4 2.3
Feb. 10	44.98 0.16	32.5 2.6	44.86 0.13	41.7 2.4	6.11 0.12	62.1 2.1
20	45.14 0.20	29.9 2.4	44.99 0.17	39.3 2.0	6.23 0.15	60.0 1.8
March 2	45.34 0.25	27.5 2.0	45.16 0.22	37.3 1.7	6.38 0.19	58.2 1.5
12	45.59 0.28	25.5 1.4	45.38 0.26	35.6 1.2	6.57 0.22	56.7 1.0
22	45.87 0.32	24.1 0.8	45.64 0.28	34.4 0.8	6.79 0.26	55.7 0.6
April 1	46.19 0.35	23.3 0.2	45.92 0.31	33.6 0.2	7.05 0.28	55.1 0.1
11	46.54 0.36	23.1 0.3	46.23 0.34	33.4 0.3	7.33 0.30	55.0 0.3
21	46.90 0.37	23.4 0.8	46.57 0.36	33.7 0.9	7.63 0.32	55.3 0.8
May 1	47.27 0.38	24.2 1.4	46.93 0.36	34.6 1.3	7.95 0.33	56.1 1.3
11	47.65 0.36	25.6 1.9	47.29 0.36	35.9 1.8	8.28 0.33	57.4 1.8
21	48.01 0.35	27.5 2.4	47.65 0.35	37.7 2.3	8.61 0.32	59.2 2.2
31	48.36 0.31	29.9 2.7	48.00 0.33	40.0 2.6	8.93 0.30	61.4 2.4
June 10	48.67 0.28	32.6 3.0	48.33 0.29	42.6 3.0	9.23 0.27	63.8 2.7
20	48.95 0.24	35.6 3.3	48.62 0.26	45.6 3.2	9.50 0.25	66.5 2.8
30	49.19 0.19	38.9 3.3	48.88 0.22	48.8 3.3	9.75 0.22	69.3 2.9
July 10	49.38 0.14	42.2 3.4	49.10 0.18	52.1 3.3	9.97 0.17	72.2 3.0
20	49.52 0.07	45.6 3.4	49.28 0.12	55.4 3.2	10.14 0.12	75.2 2.9
30	49.59 0.02	49.0 3.3	49.40 0.07	58.6 3.2	10.26 0.07	78.1 2.8
Aug. 9	49.61 0.04	52.3 3.1	49.47 0.01	61.8 3.0	10.33 0.02	80.9 2.6
19	49.57 0.09	55.4 2.8	49.48 0.04	64.8 2.9	10.35 0.02	83.5 2.5
29	49.48 0.14	58.2 2.5	49.44 0.08	67.7 2.6	10.33 0.07	86.0 2.2
Sept. 8	49.34 0.18	60.7 2.2	49.36 0.12	70.3 2.3	10.26 0.10	88.2 1.9
18	49.16 0.22	62.9 1.9	49.24 0.15	72.6 1.9	10.16 0.14	90.1 1.5
28	48.94 0.24	64.8 1.4	49.09 0.18	74.5 1.5	10.02 0.16	91.6 1.2
Oct. 8	48.70 0.26	66.2 0.9	48.91 0.20	76.0 1.1	9.86 0.18	92.8 0.8
18	48.44 0.26	67.1 0.3	48.71 0.22	77.1 0.5	9.68 0.19	93.6 0.4
28	48.18 0.27	67.4 0.1	48.49 0.22	77.6 0.1	9.49 0.19	94.0 0.0
Nov. 7	47.91 0.25	67.3 0.6	48.27 0.20	77.7 0.3	9.30 0.19	94.0 0.4
17	47.66 0.23	66.7 1.1	48.07 0.19	77.4 0.7	9.11 0.17	93.6 0.8
27	47.43 0.20	65.6 1.5	47.88 0.17	76.7 1.1	8.94 0.15	92.8 1.2
Dec. 7	47.23 0.16	64.1 2.0	47.71 0.14	75.6 1.6	8.79 0.12	91.6 1.5
17	47.07 0.11	62.1 2.3	47.57 0.10	74.0 2.0	8.67 0.09	90.1 1.8
27	46.96 0.08	59.8 2.7	47.47 0.06	72.0 2.3	8.58 0.06	88.3 2.1
37	46.88	57.1	47.41	69.7	8.52	86.2

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α CEPHEI.		β AQUARI.		β CEPHEI.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 21 ^m 15	[°] 62 ['] 0	^h 21 ^m 24	[°] 6 ['] 9	^h 21 ^m 26	[°] 69 ['] 57
Jan. 1	16.88 0.20	38.1 2.7	20.63 0.01	74.8 0.6	50.48 0.32	53.5 2.6
11	16.68 0.12	35.4 3.0	20.62 0.01	75.4 0.5	50.16 0.25	50.9 2.9
21	16.56 0.04	32.4 3.2	20.63 0.05	75.9 0.4	49.91 0.15	48.0 3.2
31	16.52 0.03	29.2 3.2	20.68 0.08	76.3 0.2	49.76 0.02	44.8 3.2
Feb. 10	16.55 0.12	26.0 3.1	20.76 0.11	76.5 0.1	49.74 0.10	41.6 3.2
20	16.67 0.21	22.9 2.9	20.87 0.14	76.6 0.1	49.84 0.22	38.4 3.1
March 2	16.88 0.27	20.0 2.6	21.01 0.17	76.5 0.4	50.06 0.32	35.3 2.8
12	17.15 0.34	17.4 2.1	21.18 0.20	76.1 0.5	50.38 0.43	32.5 2.4
22	17.49 0.40	15.3 1.7	21.38 0.23	75.6 0.8	50.81 0.51	30.1 2.0
April 1	17.89 0.46	13.6 1.0	21.61 0.25	74.8 1.0	51.32 0.59	28.1 1.3
11	18.35 0.50	12.6 0.5	21.86 0.27	73.8 1.3	51.91 0.64	26.8 0.7
21	18.85 0.52	12.1 0.2	22.13 0.28	72.5 1.4	52.55 0.68	26.1 0.2
May 1	19.37 0.53	12.3 0.8	22.41 0.30	71.1 1.6	53.23 0.69	25.9 0.5
11	19.90 0.52	13.1 1.4	22.71 0.31	69.5 1.8	53.92 0.69	26.4 1.1
21	20.42 0.51	14.5 1.9	23.02 0.31	67.7 1.8	54.61 0.67	27.5 1.7
31	20.93 0.47	16.4 2.4	23.33 0.29	65.9 1.9	55.28 0.62	29.2 2.2
June 10	21.40 0.42	18.8 2.8	23.62 0.28	64.0 1.7	55.90 0.56	31.4 2.6
20	21.82 0.35	21.6 3.1	23.90 0.26	62.3 1.6	56.46 0.48	34.0 3.0
30	22.17 0.30	24.7 3.4	24.16 0.23	60.7 1.5	56.94 0.38	37.0 3.4
July 10	22.47 0.22	28.1 3.6	24.39 0.19	59.2 1.4	57.32 0.30	40.4 3.5
20	22.69 0.14	31.7 3.7	24.58 0.15	57.8 1.2	57.62 0.19	43.9 3.7
30	22.83 0.06	35.4 3.7	24.73 0.11	56.6 1.0	57.81 0.09	47.6 3.7
Aug. 9	22.89 0.02	39.1 3.6	24.84 0.06	55.6 0.8	57.90 0.02	51.3 3.7
19	22.87 0.09	42.7 3.4	24.90 0.02	54.8 0.6	57.88 0.14	55.0 3.6
29	22.78 0.17	46.1 3.2	24.92 0.02	54.2 0.4	57.74 0.23	58.6 3.5
Sept. 8	22.61 0.24	49.3 3.0	24.90 0.06	53.8 0.2	57.51 0.32	62.1 3.2
18	22.37 0.29	52.3 2.6	24.84 0.09	53.6 0.0	57.19 0.40	65.3 2.8
28	22.08 0.25	54.9 2.2	24.75 0.12	53.6 0.1	56.79 0.47	68.1 2.4
Oct. 8	21.73 0.38	57.1 1.8	24.63 0.14	53.7 0.2	56.32 0.53	70.5 2.1
18	21.35 0.41	58.9 1.2	24.49 0.15	53.9 0.4	55.79 0.56	72.6 1.6
28	20.94 0.42	60.1 0.6	24.34 0.15	54.3 0.5	55.23 0.59	74.2 1.0
Nov. 7	20.52 0.42	60.7 0.1	24.19 0.15	54.8 0.5	54.64 0.60	75.2 0.4
17	20.10 0.41	60.8 0.4	24.04 0.12	55.3 0.6	54.04 0.60	75.6 0.2
27	19.69 0.38	60.4 1.0	23.92 0.11	55.9 0.6	53.44 0.57	75.4 0.8
Dec. 7	19.31 0.34	59.4 1.5	23.81 0.09	56.5 0.7	52.87 0.53	74.6 1.3
17	18.97 0.30	57.9 2.1	23.72 0.06	57.2 0.6	52.34 0.46	73.3 1.8
27	18.67 0.24	55.8 2.5	23.66 0.04	57.8 0.6	51.88 0.38	71.5 2.3
37	18.43	53.3	23.62	58.4	51.50	69.2

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon!

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Pegasi.		α Aquarii.		α Gruis.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h ^m 21 37	[°] ['] 9 14	^h ^m 21 58	[°] ['] 0 58	^h ^m 21 59	[°] ['] 47 36
Jan. 1	27.48 0.03	62.6 1.3	44.90 0.04	57.8 0.7	34.77 0.09	85.3 1.5
11	27.45 0.00	61.3 1.3	44.86 0.02	58.5 0.7	34.68 0.04	83.8 1.7
21	27.45 0.03	60.0 1.3	44.84 0.01	59.2 0.6	34.64 0.00	82.1 2.0
31	27.48 0.06	58.7 1.1	44.85 0.04	59.8 0.6	34.64 0.05	80.1 2.3
Feb. 10	27.54 0.09	57.6 0.9	44.89 0.08	60.4 0.4	34.69 0.10	77.8 2.4
20	27.63 0.13	56.7 0.8	44.97 0.10	60.8 0.2	34.79 0.13	75.4 2.6
March 2	27.76 0.15	55.9 0.5	45.07 0.14	61.0 0.1	34.92 0.18	72.8 2.6
12	27.91 0.18	55.4 0.2	45.21 0.16	60.9 0.3	35.10 0.23	70.2 2.6
22	28.09 0.21	55.2 0.1	45.37 0.19	60.6 0.6	35.33 0.27	67.6 2.6
April 1	28.30 0.24	55.3 0.5	45.56 0.23	60.0 0.9	35.60 0.31	65.0 2.5
11	28.54 0.27	55.8 0.8	45.79 0.25	59.1 1.1	35.91 0.34	62.5 2.3
21	28.81 0.28	56.6 1.1	46.04 0.28	58.0 1.4	36.25 0.37	60.2 2.1
May 1	29.09 0.30	57.7 1.4	46.32 0.29	56.6 1.6	36.62 0.40	58.1 1.9
11	29.39 0.31	59.1 1.7	46.61 0.30	55.0 1.8	37.02 0.41	56.2 1.7
21	29.70 0.31	60.8 2.0	46.91 0.31	53.2 1.9	37.43 0.42	54.5 1.3
31	30.01 0.30	62.8 2.1	47.22 0.31	51.3 2.0	37.85 0.41	53.2 1.0
June 10	30.31 0.27	64.9 2.2	47.53 0.29	49.3 2.0	38.26 0.42	52.2 0.6
20	30.58 0.25	67.1 2.3	47.82 0.27	47.3 1.8	38.68 0.38	51.6 0.2
30	30.83 0.23	69.4 2.2	48.09 0.25	45.5 1.8	39.06 0.35	51.4 0.1
July 10	31.06 0.20	71.6 2.2	48.34 0.21	43.7 1.7	39.41 0.28	51.5 0.6
20	31.26 0.16	73.8 2.0	48.55 0.18	42.0 1.6	39.69 0.25	52.1 1.0
30	31.42 0.12	75.8 1.8	48.73 0.14	40.4 1.4	39.94 0.19	53.1 1.3
Aug. 9	31.54 0.07	77.6 1.7	48.87 0.09	39.0 1.1	40.13 0.13	54.4 1.5
19	31.61 0.02	79.3 1.5	48.96 0.05	37.9 0.9	40.26 0.06	55.9 1.7
29	31.63 0.02	80.8 1.3	49.01 0.01	37.0 0.7	40.32 0.00	57.6 1.8
Sept. 8	31.61 0.05	82.1 1.0	49.02 0.03	36.3 0.5	40.32 0.06	59.4 1.9
18	31.56 0.09	83.1 0.8	48.99 0.06	35.8 0.3	40.26 0.11	61.3 1.9
28	31.47 0.12	83.9 0.5	48.93 0.10	35.5 0.1	40.15 0.16	63.2 1.8
Oct. 8	31.35 0.13	84.4 0.3	48.83 0.12	35.4 0.1	39.99 0.20	65.0 1.6
18	31.22 0.14	84.7 0.0	48.71 0.13	35.5 0.2	39.79 0.23	66.6 1.3
28	31.08 0.15	84.7 0.2	48.58 0.14	35.7 0.4	39.56 0.24	67.9 1.0
Nov. 7	30.93 0.15	84.5 0.4	48.44 0.14	36.1 0.5	39.32 0.24	68.9 0.7
17	30.78 0.13	84.1 0.6	48.30 0.13	36.6 0.6	39.08 0.23	69.6 0.3
27	30.65 0.12	83.5 0.9	48.17 0.12	37.2 0.7	38.85 0.21	69.9 0.2
Dec. 7	30.53 0.10	82.6 1.0	48.05 0.10	37.9 0.7	38.64 0.19	69.7 0.6
17	30.43 0.08	81.6 1.1	47.95 0.08	38.6 0.8	38.45 0.15	69.1 0.9
27	30.35 0.05	80.5 1.2	47.87 0.06	39.4 0.9	38.30 0.12	68.2 1.2
37	30.30	79.3	47.81	40.3	38.18	67.0

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	ζ Pegasi.		α PISCIS AUSTRALIS. (Fomalhaut.)		α PEGASI. (Markab.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 22 ^m 34	[°] 10 ['] 7	^h 22 ^m 50	[°] 30 ['] 20	^h 22 ^m 57	[°] 14 ['] 28
Jan. 1	37.96 0.07	11.2 1.1	4.66 0.10	56.6 0.4	56.75 0.09	18.5 1.1
11	37.89 0.05	10.1 1.2	4.56 0.07	56.2 0.8	56.66 0.08	17.4 1.2
21	37.84 0.03	8.9 1.1	4.49 0.03	55.4 1.0	56.58 0.05	16.2 1.3
31	37.81 0.01	7.8 1.0	4.46 0.01	54.4 1.3	56.53 0.02	14.9 1.3
Feb. 10	37.80 0.03	6.8 0.9	4.45 0.02	53.1 1.5	56.51 0.00	13.6 1.2
20	37.83 0.08	5.9 0.8	4.47 0.06	51.6 1.6	56.51 0.04	12.4 1.0
March 2	37.91 0.10	5.1 0.6	4.53 0.09	50.0 1.8	56.55 0.08	11.4 0.8
12	38.01 0.13	4.5 0.3	4.62 0.13	48.2 2.0	56.63 0.11	10.6 0.5
22	38.14 0.16	4.2 0.0	4.75 0.16	46.2 2.2	56.74 0.15	10.1 0.3
April 1	38.30 0.20	4.2 0.3	4.91 0.21	44.0 2.3	56.89 0.19	9.8 0.1
11	38.50 0.24	4.5 0.7	5.12 0.24	41.7 2.3	57.08 0.22	9.9 0.4
21	38.74 0.27	5.2 1.0	5.36 0.26	39.4 2.2	57.30 0.24	10.3 0.8
May 1	39.01 0.28	6.2 1.3	5.62 0.29	37.2 2.2	57.54 0.27	11.1 1.1
11	39.29 0.30	7.5 1.6	5.91 0.33	35.0 2.1	57.81 0.30	12.2 1.4
21	39.59 0.30	9.1 1.8	6.24 0.35	32.9 2.0	58.11 0.32	13.6 1.7
31	39.89 0.31	10.9 2.0	6.59 0.35	30.9 1.8	58.43 0.32	15.3 2.0
June 10	40.20 0.31	12.9 2.2	6.94 0.34	29.1 1.5	58.75 0.31	17.3 2.2
20	40.51 0.30	15.1 2.2	7.28 0.34	27.6 1.2	59.06 0.31	19.5 2.2
30	40.81 0.26	17.3 2.2	7.62 0.31	26.4 0.9	59.37 0.29	21.7 2.3
July 10	41.07 0.24	19.5 2.2	7.93 0.28	25.5 0.6	59.66 0.25	24.0 2.3
20	41.31 0.20	21.7 2.2	8.21 0.26	24.9 0.3	59.91 0.22	26.3 2.3
30	41.51 0.17	23.9 2.1	8.46 0.21	24.6 0.1	60.13 0.18	28.6 2.2
Aug. 9	41.68 0.13	26.0 1.7	8.67 0.16	24.7 0.5	60.31 0.15	30.8 2.0
19	41.81 0.09	27.7 1.5	8.83 0.11	25.2 0.8	60.46 0.11	32.8 1.8
29	41.90 0.04	29.2 1.4	8.94 0.06	26.0 1.0	60.57 0.07	34.6 1.6
Sept. 8	41.94 0.00	30.6 1.1	9.00 0.02	27.0 1.2	60.64 0.03	36.2 1.4
18	41.94 0.04	31.7 0.9	9.02 0.02	28.2 1.3	60.67 0.02	37.6 1.2
28	41.90 0.07	32.6 0.7	9.00 0.07	29.5 1.4	60.65 0.05	38.8 1.0
Oct. 8	41.83 0.09	33.3 0.4	8.93 0.11	30.9 1.4	60.60 0.07	39.8 0.7
18	41.74 0.11	33.7 0.2	8.82 0.13	32.3 1.4	60.53 0.10	40.5 0.4
28	41.63 0.13	33.9 0.0	8.69 0.15	33.7 1.3	60.43 0.12	40.9 0.2
Nov. 7	41.50 0.13	33.9 0.3	8.54 0.15	35.0 1.0	60.31 0.12	41.1 0.1
17	41.37 0.13	33.6 0.4	8.39 0.16	36.0 0.8	60.19 0.13	41.0 0.4
27	41.24 0.13	33.2 0.7	8.23 0.15	36.8 0.6	60.06 0.13	40.6 0.6
Dec. 7	41.11 0.12	32.5 0.8	8.08 0.14	37.4 0.3	59.93 0.12	40.0 0.7
17	40.99 0.10	31.7 1.0	7.94 0.14	37.7 0.1	59.81 0.11	39.3 0.9
27	40.89 0.09	30.7 1.1	7.80 0.11	37.8 0.3	59.70 0.11	38.4 1.1
37	40.80	29.6	7.69	37.5	59.59	37.3

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	♌ Pisium.		γ Cephei.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 23 ^m 32	[°] 4 53	^h 23 ^m 33	[°] 76
Jan. 1	54.95 0.10	10.0 0.8	44.91 0.81	52 30.1 1.1
11	54.85 0.08	9.2 0.8	44.10 0.75	52 29.0 1.5
21	54.77 0.06	8.4 0.8	43.35 0.65	52 27.5 2.0
31	54.71 0.05	7.6 0.8	42.70 0.53	52 25.5 2.5
Feb. 10	54.66 0.03	6.8 0.6	42.17 0.39	52 23.0 2.8
20	54.63 0.01	6.2 0.4	41.78 0.22	52 20.2 3.1
March 2	54.64 0.04	5.8 0.2	41.56 0.04	52 17.1 3.1
12	54.68 0.08	5.6 0.0	41.52 0.14	52 14.0 3.1
22	54.76 0.11	5.6 0.2	41.66 0.32	52 10.9 3.0
April 1	54.87 0.15	5.8 0.5	41.98 0.49	52 7.9 2.6
11	55.02 0.19	6.3 0.8	42.47 0.64	52 5.3 2.3
21	55.21 0.22	7.1 1.1	43.11 0.77	52 3.0 1.8
May 1	55.43 0.25	8.2 1.4	43.88 0.88	52 1.2 1.2
11	55.68 0.28	9.6 1.6	44.76 0.97	52 0.0 0.7
21	55.96 0.30	11.2 1.7	45.73 1.02	51 59.3 0.1
31	56.26 0.31	12.9 1.9	46.75 1.04	51 59.2 0.5
June 10	56.57 0.32	14.8 2.0	47.79 1.04	51 59.7 1.1
20	56.89 0.31	16.8 2.1	48.83 0.98	52 0.8 1.5
30	57.20 0.30	18.9 2.0	49.81 0.93	52 2.3 2.1
July 10	57.50 0.27	20.9 2.0	50.74 0.85	52 4.4 2.5
20	57.77 0.25	22.9 1.9	51.59 0.75	52 6.9 2.9
30	58.02 0.22	24.8 1.8	52.34 0.63	52 9.8 3.2
Aug. 9	58.24 0.18	26.6 1.5	52.97 0.50	52 13.0 3.5
19	58.42 0.13	28.1 1.3	53.47 0.36	52 16.5 3.6
29	58.55 0.10	29.4 1.1	53.83 0.22	52 20.1 3.7
Sept. 8	58.65 0.06	30.5 0.9	54.05 0.08	52 23.8 3.8
18	58.71 0.03	31.4 0.6	54.13 0.06	52 27.6 3.8
28	58.74 0.01	32.0 0.4	54.07 0.20	52 31.4 3.6
Oct. 8	58.73 0.04	32.4 0.1	53.87 0.34	52 35.0 3.4
18	58.69 0.06	32.5 0.0	53.53 0.46	52 38.4 3.1
28	58.63 0.08	32.5 0.2	53.07 0.57	52 41.5 2.7
Nov. 7	58.55 0.10	32.3 0.3	52.50 0.67	52 44.2 2.3
17	58.45 0.11	32.0 0.5	51.83 0.75	52 46.5 1.7
27	58.34 0.11	31.5 0.6	51.08 0.82	52 48.2 1.2
Dec. 7	58.23 0.12	30.9 0.7	50.26 0.85	52 49.4 0.6
17	58.11 0.11	30.2 0.8	49.41 0.87	52 50.0 0.1
27	58.00 0.11	29.4 0.9	48.54 0.84	52 49.9 0.7
37	57.89	28.5	47.70	52 49.2

after the 22d of March it begins at the Sidereal 0h. before the Mean Noon.

TABLE GIVING THE CORRECTION OF THREE OF THE POLAR STARS
FOR TERMS OF NUTATION INVOLVING 2ϵ .

$\Delta\alpha - 180^\circ$	51 Cephei.		σ Octanis.		λ Urs. Min.		$\Delta\alpha - 180^\circ$	$\Delta\alpha - 180^\circ$	51 Cephei.		σ Octanis.		λ Urs. Min.		$\Delta\alpha - 180^\circ$
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.			R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	
0	+018	+09	-025	-09	-159	-08	90	45	-122	+01	-436	+01	+224	-04	135
1	.014	.09	.040	.09	.151	.08	91	46	.123	.00	.435	.01	.229	.04	136
2	.009	.09	.055	.09	.143	.08	92	47	.124	.00	.433	.02	.234	.04	137
3	.005	.09	.070	.09	.135	.08	93	48	.124	+00	.431	.02	.239	.04	138
4	+001	.09	.085	.09	.127	.08	94	49	.124	-01	.428	.02	.244	.04	139
5	-.003	+09	-100	-09	-118	-08	95	50	-.124	-01	-.425	+02	+.249	-03	140
6	.008	.09	.115	.08	.109	.08	96	51	.123	.01	.421	.03	.253	.03	141
7	.012	.09	.130	.08	.100	.08	97	52	.123	.02	.417	.03	.256	.03	142
8	.017	.09	.144	.08	.091	.08	98	53	.122	.02	.412	.03	.259	.02	143
9	.021	.09	.158	.08	.082	.08	99	54	.122	.02	.407	.04	.252	.02	144
10	-.025	+09	-172	-08	-073	-09	100	55	-.121	-02	-.401	+04	+.255	-02	145
11	.029	.09	.186	.08	.064	.09	101	56	.121	.03	.395	.04	.267	.02	146
12	.033	.09	.200	.08	.055	.09	102	57	.120	.03	.389	.04	.269	.01	147
13	.037	.08	.213	.08	.046	.09	103	58	.119	.03	.382	.05	.271	.01	148
14	.041	.08	.226	.08	.036	.09	104	59	.117	.04	.374	.05	.273	-01	149
15	-.045	+08	-.239	-08	-.026	-09	105	60	-.115	-04	-.365	+05	+.274	+00	150
16	.049	.08	.251	.07	.017	.09	106	61	.114	.04	.356	.05	.275	.00	151
17	.053	.08	.263	.07	-.008	.09	107	62	.112	.04	.347	.06	.275	.00	152
18	.056	.08	.275	.07	+.002	.09	108	63	.110	.05	.338	.06	.275	.01	153
19	.060	.08	.287	.07	.012	.09	109	64	.108	.05	.328	.06	.275	.01	154
20	-.065	+08	-.299	-07	+.022	-09	110	65	-.106	-05	-.318	+06	+.275	+01	155
21	.069	.07	.310	.07	.032	.09	111	66	.102	.06	.307	.07	.274	.02	156
22	.073	.07	.320	.06	.041	.09	112	67	.100	.06	.296	.07	.272	.02	157
23	.076	.07	.330	.06	.050	.08	113	68	.098	.06	.284	.07	.270	.02	158
24	.079	.07	.340	.06	.060	.08	114	69	.095	.06	.272	.07	.268	.02	159
25	-.082	+07	-.350	-06	+.070	-08	115	70	-.093	-06	-.261	+07	+.266	+03	160
26	.085	.06	.359	.05	.079	.08	116	71	.090	.07	.249	.08	.263	.03	161
27	.088	.06	.368	.05	.088	.08	117	72	.087	.07	.237	.08	.260	.03	162
28	.091	.06	.376	.05	.097	.08	118	73	.084	.07	.224	.08	.257	.04	163
29	.094	.05	.383	.04	.106	.08	119	74	.080	.07	.211	.08	.254	.04	164
30	-.097	+05	-.390	-04	+.115	-08	120	75	-.077	-07	-.197	+08	+.250	+04	165
31	.100	.05	.396	.04	.124	.08	121	76	.074	.08	.183	.09	.246	.04	166
32	.103	.05	.402	.03	.133	.08	122	77	.070	.08	.169	.09	.242	.05	167
33	.105	.04	.408	.03	.142	.07	123	78	.066	.08	.155	.09	.237	.05	168
34	.107	.04	.413	.03	.150	.07	124	79	.062	.08	.141	.09	.232	.05	169
35	-.109	+04	-.418	-02	+.158	-07	125	80	-.059	-08	-.126	+09	+.227	+06	170
36	.111	.04	.423	.02	.165	.07	126	81	.055	.08	.111	.09	.221	.06	171
37	.113	.03	.427	.02	.172	.06	127	82	.050	.08	.096	.09	.215	.06	172
38	.115	.03	.430	-01	.179	.06	128	83	.047	.09	.081	.09	.209	.06	173
39	.116	.03	.432	+01	.186	.06	129	84	.043	.09	.066	.09	.203	.06	174
40	-.117	+03	-.434	+01	+.193	-06	130	85	-.039	-09	-.051	+09	+.196	+07	175
41	.118	.02	.435	.00	.199	.05	131	86	.035	.09	.036	.09	.189	.07	176
42	.119	.02	.436	.00	.206	.05	132	87	.030	.09	.021	.09	.182	.07	177
43	.120	.01	.436	.00	.212	.05	133	88	.026	.09	-.006	.09	.175	.07	178
44	.121	.01	.436	.00	.218	.05	134	89	.022	.09	+.009	.09	.167	.07	179
45	.122	.01	.436	+01	+.224	-04	135	90	-.018	-09	+.025	+09	+.159	+08	180

NOTE. — When the Argument is on the right-hand side of the Table, the sign of the correction is to be reversed.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.			APPARENT DECLINATION.			HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Apparent Noon.		Mean Noon.	Apparent Noon.		Right Ascension.	Declination.				
Jan. 1	18 47 16.03	16.75		23 0 40.5	39.8		11.040	12.45	+ 3 51.15	16' 18.39	11.07	18 43 24.93
2	18 51 40.69	41.49		22 55 27.8	26.8		11.020	13.59	4 19.24	18.39	11.02	18 47 21.48
3	18 56 4.98	5.86		22 49 47.8	46.6		11.003	14.73	4 47.01	18.38	10.97	18 51 18.04
4	19 0 28.87	29.83		22 43 40.7	39.3		10.986	15.86	5 14.37	18.37	10.92	18 55 14.59
5	19 4 52.34	53.38		22 37 6.5	4.9		10.969	16.98	5 41.39	18.36	10.86	18 59 11.15
6	19 9 15.37	16.49		22 30 5.4	3.6		10.951	18.09	6 7.77	18.33	10.79	19 3 7.71
7	19 13 37.94	39.14		22 22 37.7	35.6		10.931	19.20	6 33.79	18.30	10.72	19 7 4.26
8	19 18 0.03	1.31		22 14 43.6	41.2		10.910	20.30	6 59.32	18.26	10.65	19 11 0.82
9	19 22 21.63	22.93		22 6 23.2	20.5		10.888	21.39	7 24.34	18.22	10.58	19 14 57.38
10	19 26 42.63	43.05		21 57 36.8	33.8		10.865	22.47	7 48.83	18.17	10.51	19 18 53.94
11	19 31 3.11	4.63		21 48 24.7	21.4		10.842	23.53	8 12.76	18.12	10.41	19 22 50.49
12	19 35 23.01	24.56		21 38 47.1	43.5		10.817	24.59	8 36.10	18.06	10.33	19 26 47.05
13	19 39 42.32	43.93		21 28 44.4	40.5		10.792	25.64	8 58.85	18.00	10.25	19 30 43.61
14	19 44 1.00	2.67		21 18 16.7	12.5		10.765	26.67	9 20.98	17.93	10.17	19 34 40.16
15	19 48 19.04	20.77		21 7 24.4	19.9		10.738	27.69	9 42.47	17.85	10.09	19 38 36.71
16	19 52 36.42	38.21		20 56 7.8	3.0		10.710	28.70	10 3.29	17.78	10.00	19 42 33.27
17	19 56 53.11	54.96		20 44 27.2	22.1		10.681	29.69	10 23.42	17.70	9.90	19 46 29.83
18	20 1 9.10	11.00		20 32 22.9	17.5		10.651	30.66	10 42.84	17.61	9.80	19 50 26.93
19	20 5 24.36	26.31		20 19 55.4	49.7		10.620	31.62	11 1.54	17.52	9.70	19 54 22.94
20	20 9 33.88	40.88		20 6 65.0	58.9		10.589	32.57	11 19.52	17.42	9.60	19 58 19.50
21	20 13 52.64	54.69		19 53 52.0	45.6		10.557	33.51	11 36.72	17.32	9.50	20 2 16.06
22	20 18 5.63	7.72		19 40 16.8	10.1		10.525	34.42	11 53.14	17.22	9.39	20 5 12.62
23	20 22 17.83	19.96		19 26 19.7	12.7		10.492	35.32	12 8.78	17.11	9.28	20 10 9.17
24	20 26 21.23	31.40		19 11 61.3	53.9		10.458	36.21	12 23.62	17.00	9.17	20 14 5.73
25	20 30 39.82	42.02		18 57 21.9	14.1		10.424	37.07	12 37.65	16.88	9.06	20 18 2.28
26	20 34 49.58	51.81		18 42 21.8	13.6		10.390	37.93	12 50.85	16.76	8.95	20 21 58.84
27	20 38 58.52	63.77		18 26 61.3	52.8		10.355	38.77	13 3.21	16.64	8.84	20 25 55.40
28	20 43 6.62	8.90		18 11 20.9	12.1		10.320	39.59	13 14.75	16.51	8.73	20 29 51.95
29	20 47 13.89	16.19		17 55 21.1	12.0		10.285	40.39	13 25.47	16.38	8.62	20 33 48.51
30	20 51 20.31	22.63		17 38 62.1	52.7		10.250	41.18	13 35.34	16.25	8.50	20 37 45.07
Feb. 1	20 55 25.89	23.23		17 22 24.4	14.7		10.215	41.96	13 44.36	16.11	8.39	20 41 41.62
2	20 59 30.65	33.01		17 5 28.4	18.4		10.181	42.71	13 52.54	15.96	8.28	20 45 38.17
3	21 3 34.58	36.95		16 48 14.4	4.2		10.147	43.46	13 59.90	15.81	8.16	20 49 34.73
4	21 7 37.63	39.07		16 30 42.9	32.5		10.113	44.18	14 6.45	15.66	8.04	20 53 31.28
5	21 11 30.97	42.36		16 12 54.2	43.6		10.079	44.89	14 12.19	15.51	7.92	20 57 27.84
6	21 15 41.46	43.86		15 54 48.6	37.8		10.045	45.58	14 17.11	15.34	7.80	21 1 24.39
7	21 19 42.14	44.54		15 36 26.6	15.6		10.012	46.26	14 21.22	15.17	7.68	21 5 20.95
8	21 23 42.01	44.41		15 17 48.6	37.4		9.979	46.91	14 24.53	15.00	7.57	21 9 17.50
9	21 27 41.09	43.49		14 58 54.9	43.5		9.946	47.56	14 27.06	14.82	7.46	21 13 14.66
10	21 31 39.41	41.81		14 39 46.1	34.5		9.914	48.18	14 28.81	14.63	7.35	21 17 10.61
11	21 35 36.96	39.35		14 20 22.5	10.7		9.882	48.79	14 29.79	14.44	7.24	21 21 7.17
12	21 39 33.75	36.13		14 0 44.5	32.5		9.850	49.37	14 30.02	14.25	7.13	21 25 3.72
13	21 43 20.79	32.15		13 40 52.5	40.4		9.819	49.95	14 29.49	14.06	7.02	21 29 0.28
14	21 47 25.06	27.42		13 20 47.0	34.8		9.789	50.50	14 28.21	13.86	6.91	21 32 56.83
15	21 51 19.61	21.96		13 0 28.4	16.1		9.759	51.04	14 26.30	13.66	6.80	21 36 53.38
16	21 55 13.44	15.78		12 39 57.1	44.7		9.729	51.56	14 23.47	13.46	6.69	21 40 49.94
17	21 59 6.56	8.88		12 19 13.6	1.1		9.699	52.05	14 20.03	13.25	6.59	21 44 46.49
18	22 0 58.97	61.27		11 58 18.3	5.7		9.669	52.53	14 15.87	13.04	6.49	21 48 43.05
19	22 6 50.67	52.95		11 36 71.7	59.1		9.640	52.99	14 11.01	12.83	6.39	21 52 39.60
20	22 10 41.63	43.94		11 15 54.2	41.6		9.611	53.44	14 5.46	12.62	6.29	21 56 36.15
21	22 14 32.02	34.26		10 54 26.1	13.5		9.583	53.88	13 59.24	12.40	6.19	22 0 32.71
22	22 18 21.69	23.91		10 32 47.9	35.3		9.556	54.28	13 52.36	12.18	6.10	22 4 29.26
23	22 22 10.71	12.90		10 10 69.1	47.5		9.529	54.68	13 44.82	11.96	6.01	22 8 25.82
24	22 25 59.08	61.24		9 48 63.1	50.5		9.503	55.05	13 36.63	11.73	5.92	22 12 22.37
25	22 29 46.82	48.95		9 26 57.3	44.8		9.477	55.41	13 27.81	11.50	5.83	22 16 18.92
26	22 33 33.95	36.05		9 4 43.2	30.8		9.452	55.75	13 18.39	11.27	5.74	22 20 15.47
27	22 37 20.48	22.55		8 42 21.1	8.8		9.428	56.08	13 8.37	11.04	5.66	22 24 12.03
28	22 41 6.43	8.47		8 19 51.3	39.1		9.404	56.39	12 57.76	10.81	5.58	22 28 8.58
29	22 44 51.81	53.81		7 57 14.3	2.2		9.380	56.68	12 46.58	10.57	5.50	22 32 5.13
30	22 48 36.65	38.61		7 34 30.6	18.6		9.358	56.96	12 34.86	10.33	5.40	22 36 1.69
31	22 52 20.97	22.90		7 11 40.4	28.5		9.337	57.23	12 22.64	10.09	5.35	22 39 58.24
32	22 56 4.79	6.68		6 48 44.1	32.3		9.317	57.47	+12 9.91 16	9.84 1	5.28	22 43 54.79

NOTE.—For Mean Interval of Semidiameter passing the Meridian, subtract 0s.18 from the Sidereal Interval.

300 SOLAR EPHEMERIS, 1863.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.				
Mar. 1	^h 22 ^m 48 ^s 36.65	^s 38.61	[°] 7 ['] 34 ["] 30.6	18.6	9.358	56.96	+12 34.86	16 10.33	^m 5.40	^h 22 ^m 36 ^s 1.69
2	22 52 20.97	22.90	7 11 40.4	23.5	9.337	57.23	12 22.64	10.09	5.35	22 39 58.24
3	22 56 4.79	6.68	6 48 44.1	32.3	9.317	57.47	12 9.91	9.84	5.28	22 43 54.79
4	22 59 48.14	49.99	6 25 42.1	30.5	9.237	57.70	11 56.69	9.59	5.21	22 47 51.35
5	23 3 31.03	32.84	6 2 34.7	23.3	9.279	57.91	11 43.01	9.34	5.15	22 51 47.90
6	23 7 13.49	15.26	5 39 22.3	11.1	9.261	57.11	11 28.92	9.08	5.00	22 55 44.45
7	23 10 55.54	57.27	5 15 65.3	54.3	9.245	58.30	11 14.42	8.82	5.03	22 59 41.01
8	23 14 37.20	38.89	4 52 44.1	33.3	9.229	58.47	10 59.54	8.56	4.97	23 3 37.56
9	23 18 18.50	20.15	4 29 19.0	8.4	9.214	58.62	10 44.29	8.30	4.92	23 7 34.11
10	23 21 59.46	61.06	4 5 50.4	40.0	9.200	58.76	10 28.70	8.04	4.87	23 11 30.66
11	23 25 40.10	41.65	3 42 18.6	8.5	9.187	58.88	10 12.78	7.77	4.82	23 15 27.22
12	23 29 20.44	21.95	3 18 44.1	34.2	9.175	58.99	9 56.57	7.50	4.78	23 19 23.77
13	23 33 0.50	1.97	2 54 67.2	57.6	9.164	59.08	9 40.09	7.23	4.74	23 23 20.32
14	23 36 40.31	41.74	2 31 28.3	19.0	9.153	59.15	9 23.35	6.96	4.70	23 27 16.87
15	23 40 19.88	21.26	2 7 47.7	38.7	9.144	59.21	9 6.36	6.69	4.66	23 31 13.43
16	23 43 59.23	63.56	1 43 65.9	57.2	9.135	59.26	8 49.16	6.41	4.62	23 35 9.98
17	23 47 38.37	39.66	1 20 23.3	14.9	9.127	59.28	8 31.75	6.14	4.59	23 39 6.53
18	23 51 17.33	18.56	0 56 40.3	32.2	9.119	59.29	8 14.16	5.87	4.56	23 43 3.09
19	23 54 56.12	57.33	0 32 57.2	49.4	9.113	59.29	7 56.40	5.60	4.54	23 46 59.64
20	23 58 34.76	35.92	0 9 14.4	6.9	9.107	59.26	7 38.49	5.32	4.52	23 50 56.19
21	0 2 13.27	14.38	+ 0 14 27.6	34.8	9.102	59.23	7 20.45	5.04	4.50	23 54 52.74
22	0 5 51.66	52.73	0 38 8.5	15.4	9.097	59.17	7 2.29	4.77	4.49	23 58 49.30
23	0 9 29.95	30.98	1 1 48.0	54.6	9.093	59.10	6 44.03	4.50	4.48	0 2 45.85
24	0 13 8.15	10.13	1 25 25.7	32.0	9.091	59.02	6 25.69	4.23	4.47	0 6 42.40
25	0 16 46.29	47.22	1 49 1.1	7.1	9.088	58.92	6 7.27	3.96	4.46	0 10 38.95
26	0 20 24.38	25.26	2 12 33.9	30.6	9.086	58.80	5 48.81	3.68	4.46	0 14 35.50
27	0 24 2.44	3.28	2 36 3.9	9.3	9.085	58.68	5 30.31	3.41	4.46	0 18 32.06
28	0 27 40.49	41.29	2 59 30.6	35.7	9.085	58.54	5 11.81	3.14	4.46	0 22 28.61
29	0 31 18.56	19.31	3 22 53.7	58.5	9.086	58.38	4 53.32	2.87	4.46	0 26 25.17
30	0 34 56.66	57.39	3 46 12.8	17.3	9.089	58.21	4 34.88	2.60	4.47	0 30 21.72
31	0 38 34.82	35.47	4 9 27.7	31.8	9.092	58.03	4 16.48	2.32	4.48	0 34 18.27
Apr. 1	0 42 13.06	13.66	4 32 38.0	41.8	9.095	57.83	3 58.17	2.05	4.50	0 38 14.82
2	0 45 51.39	51.94	4 55 43.4	46.9	9.100	57.61	3 39.97	1.78	4.52	0 42 11.37
3	0 49 29.85	30.35	5 18 43.5	46.7	9.106	57.39	3 21.87	1.50	4.54	0 46 7.93
4	0 53 8.45	8.91	5 41 38.1	41.0	9.113	57.16	3 3.92	1.22	4.56	0 50 4.48
5	0 56 47.22	47.64	6 4 26.8	29.4	9.120	56.90	2 46.15	0.94	4.59	0 54 1.03
6	1 0 26.18	26.55	6 27 9.3	11.6	9.129	56.64	2 28.55	0.67	4.62	0 57 57.58
7	1 4 5.35	5.67	6 49 45.2	47.2	9.137	56.36	2 11.17	0.40	4.65	1 1 54.13
8	1 7 44.76	45.04	7 12 14.3	16.0	9.147	56.07	1 54.03	0.12	4.68	1 5 50.68
9	1 11 24.43	24.67	7 34 36.2	37.6	9.157	55.75	1 37.15	15 59.84	4.72	1 9 47.94
10	1 15 4.36	4.56	7 56 50.5	51.7	9.159	55.43	1 20.54	59.56	4.76	1 13 43.80
11	1 18 44.57	44.73	8 18 56.8	57.7	9.181	55.10	1 4.20	59.28	4.80	1 17 40.35
12	1 22 25.09	25.21	8 40 54.9	55.5	9.195	54.74	0 48.17	59.00	4.84	1 21 36.91
13	1 26 5.94	6.02	9 2 44.4	44.8	9.209	54.37	0 32.47	58.72	4.89	1 25 33.46
14	1 29 47.13	47.17	9 24 25.0	25.2	9.223	54.00	0 17.11	58.44	4.94	1 29 30.01
15	1 33 28.67	28.67	9 45 56.3	56.4	9.238	53.60	+ 0 2.09	58.17	4.99	1 33 26.57
16	1 37 10.57	10.53	10 7 17.9	17.8	9.253	53.19	- 0 12.66	57.90	5.04	1 37 23.12
17	1 40 52.85	52.77	10 28 20.5	20.2	9.269	52.77	0 26.83	57.63	5.09	1 41 19.67
18	1 44 35.51	35.39	10 49 30.8	30.3	9.286	52.32	0 40.73	57.37	5.15	1 45 16.23
19	1 48 18.56	18.41	11 10 21.4	20.7	9.303	51.87	0 54.23	57.11	5.21	1 49 12.78
20	1 52 2.03	1.85	11 31 0.9	0.0	9.320	51.41	1 7.31	56.86	5.27	1 53 9.33
21	1 55 45.92	45.71	11 51 20.0	27.9	9.337	50.93	1 10.97	56.61	5.33	1 57 5.89
22	1 59 30.23	29.99	12 11 45.4	44.1	9.355	50.43	1 32.21	56.36	5.40	2 1 2.44
23	2 3 14.97	14.70	12 31 49.7	48.2	9.373	49.92	1 44.03	56.11	5.47	2 4 59.00
24	2 6 63.15	59.85	12 51 41.6	40.0	9.392	49.39	1 55.39	55.86	5.54	2 8 55.55
25	2 10 45.79	45.46	13 11 20.8	19.1	9.411	48.86	2 6.29	55.61	5.61	2 12 52.10
26	2 14 31.90	31.54	13 30 46.9	45.1	9.431	48.31	2 16.73	55.37	5.68	2 16 48.66
27	2 18 18.48	18.09	13 49 59.7	57.8	9.451	47.75	2 26.71	55.13	5.75	2 20 45.21
28	2 22 5.55	5.14	14 8 58.8	56.8	9.472	47.17	2 36.19	54.89	5.82	2 24 41.77
29	2 25 53.12	52.69	14 27 43.9	41.8	9.493	46.58	2 45.18	54.65	5.90	2 28 38.32
30	2 29 41.20	40.75	14 46 14.8	12.6	9.514	45.98	2 53.66	54.42	5.98	2 32 34.87
31	2 33 29.79	29.32	+15 4 31.1	28.8	9.535	45.37	- 3 1.63	15 54.19	1 6.05	2 36 31.43

NOTE. — For Mean Interval of Semidiameter passing the Meridian, subtract 0.18 from the Sidereal Interval.

SOLAR EPHEMERIS, 1863. 301

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.			APPARENT DECLINATION.			HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Ap- parent Noon.		Mean Noon.	Ap- parent Noon.		Right Ascension.	Declination.				
May 1	2 33 29.79	29.32	+15 4 31.1	28.8	9.535	45.37	- 3 1.63	15 54.19	1 6.05	2 36 31.43		
2	2 37 18.92	18.43	15 22 32.4	30.0	9.558	44.75	3 9.06	53.96	6.13	2 40 27.98		
3	2 41 8.60	8.09	15 40 18.5	16.0	9.581	44.10	3 15.94	53.73	6.21	2 44 24.54		
4	2 44 58.82	58.29	15 57 49.2	46.7	9.604	43.45	3 22.27	53.50	6.29	2 48 21.10		
5	2 48 49.63	49.05	16 15 4.1	1.6	9.628	42.79	3 28.03	53.27	6.37	2 52 17.65		
6	2 52 40.96	40.39	16 32 2.9	0.4	9.652	42.12	3 33.23	53.04	6.45	2 56 14.20		
7	2 56 32.90	32.32	16 48 45.3	42.8	9.676	41.42	3 37.66	52.81	6.53	3 0 10.76		
8	3 0 25.42	24.82	17 5 11.0	8.5	9.700	40.72	3 41.89	52.58	6.61	3 4 7.32		
9	3 4 18.53	17.92	17 21 19.6	17.1	9.725	40.00	3 45.33	52.36	6.69	3 8 3.87		
10	3 8 12.24	11.62	17 37 11.0	8.5	9.750	39.27	3 48.18	52.14	6.78	3 12 0.43		
11	3 12 6.54	5.91	17 52 44.8	42.3	9.775	38.53	3 50.44	51.92	6.87	3 15 56.98		
12	3 16 1.43	0.79	18 7 67.7	58.2	9.799	37.78	3 52.10	51.72	6.95	3 19 53.54		
13	3 19 56.92	56.27	18 22 58.4	55.9	9.824	37.02	3 53.16	51.51	7.03	3 23 50.09		
14	3 23 53.00	52.35	18 37 37.6	35.2	9.848	36.24	3 53.65	51.30	7.11	3 27 46.65		
15	3 27 49.67	49.02	18 51 58.1	55.8	9.873	35.45	3 53.54	51.10	7.19	3 31 43.20		
16	3 31 46.91	46.26	19 5 59.4	57.1	9.897	34.65	3 52.86	50.90	7.27	3 35 39.76		
17	3 35 44.72	44.07	19 19 41.3	39.0	9.921	33.84	3 51.61	50.71	7.35	3 39 36.32		
18	3 39 43.10	42.45	19 33 3.5	1.3	9.944	33.02	3 49.79	50.52	7.43	3 43 32.88		
19	3 43 42.03	41.30	19 46 5.9	3.8	9.967	32.18	3 47.40	50.34	7.51	3 47 29.43		
20	3 47 41.51	40.88	19 58 48.1	46.1	9.989	31.33	3 44.46	50.16	7.59	3 51 25.98		
21	3 51 41.53	40.91	20 11 9.8	7.9	10.011	30.48	3 41.00	49.99	7.67	3 55 22.54		
22	3 55 42.06	41.45	20 23 10.9	9.1	10.032	29.61	3 37.03	49.83	7.75	3 59 19.10		
23	3 59 43.10	42.50	20 34 51.1	49.4	10.053	28.73	3 32.55	49.67	7.82	4 3 15.65		
24	4 3 44.65	44.06	20 46 10.1	8.5	10.074	27.84	3 27.56	49.51	7.89	4 7 12.21		
25	4 7 46.70	46.13	20 57 7.7	6.2	10.095	26.95	3 22.06	49.35	7.96	4 11 8.76		
26	4 11 49.22	48.66	21 7 43.6	42.1	10.115	26.04	3 16.09	49.20	8.03	4 15 5.32		
27	4 15 52.21	51.67	21 17 57.7	56.3	10.135	25.13	3 9.66	49.05	8.10	4 19 1.88		
28	4 19 55.65	55.13	21 27 49.7	48.4	10.154	24.20	3 2.77	48.90	8.17	4 22 58.43		
29	4 23 59.54	59.04	21 37 19.5	18.3	10.172	23.28	2 55.43	48.75	8.23	4 26 54.99		
30	4 28 3.87	3.39	21 46 26.9	25.8	10.190	22.34	2 47.66	48.60	8.29	4 30 51.55		
31	4 32 8.63	8.17	21 55 11.6	10.5	10.207	21.39	2 39.46	48.46	8.35	4 34 48.10		
June 1	4 36 13.80	33.36	22 3 33.5	32.5	10.224	20.42	2 30.84	48.32	8.41	4 38 44.65		
2	4 40 19.37	18.96	22 11 32.4	31.5	10.240	19.46	2 21.82	48.19	8.47	4 42 41.21		
3	4 44 25.33	24.95	22 19 8.1	7.3	10.256	18.48	2 12.42	48.06	8.52	4 46 37.77		
4	4 48 31.67	31.32	22 26 20.5	19.8	10.272	17.51	2 2.65	47.93	8.57	4 50 34.33		
5	4 52 38.38	38.06	22 33 9.4	8.7	10.287	16.53	1 52.51	47.81	8.62	4 54 30.89		
6	4 56 45.43	45.14	22 39 34.6	34.0	10.301	15.55	1 42.02	47.69	8.66	4 58 27.45		
7	5 0 52.82	52.56	22 45 36.0	35.5	10.314	14.56	1 31.19	47.57	8.70	5 2 24.00		
8	5 5 0.52	0.29	22 51 13.5	13.1	10.327	13.57	1 20.04	47.46	8.74	5 6 20.66		
9	5 9 8.52	8.33	22 56 27.0	26.7	10.338	12.57	1 8.60	47.34	8.78	5 10 17.12		
10	5 13 16.79	16.63	23 1 16.3	16.1	10.349	11.56	0 56.88	47.24	8.81	5 14 13.68		
11	5 17 25.30	25.17	23 5 41.3	41.2	10.359	10.54	0 44.93	47.14	8.84	5 18 10.23		
12	5 21 34.04	33.94	23 9 41.9	41.9	10.369	9.52	0 32.75	47.04	8.87	5 22 6.79		
13	5 25 42.99	42.93	23 13 18.0	18.0	10.377	8.49	0 20.37	46.95	8.89	5 26 3.35		
14	5 29 52.12	52.10	23 16 29.6	29.6	10.383	7.47	0 7.80	46.86	8.91	5 29 59.91		
15	5 34 1.40	1.41	23 19 16.6	16.6	10.388	6.44	+ 0 4.92	46.78	8.93	5 33 56.46		
16	5 38 10.81	10.86	23 21 38.9	38.9	10.393	5.42	0 17.76	46.71	8.94	5 37 53.02		
17	5 42 20.31	20.40	23 23 36.5	36.5	10.396	4.38	0 30.70	46.64	8.95	5 41 49.58		
18	5 46 29.87	30.00	23 25 9.3	9.3	10.398	3.35	0 43.72	46.58	8.96	5 45 46.13		
19	5 50 39.47	39.64	23 26 17.3	17.3	10.399	2.31	0 56.78	46.52	8.97	5 49 42.69		
20	5 54 49.10	49.30	23 27 0.6	0.6	10.400	1.28	1 9.85	46.47	8.97	5 53 39.25		
21	5 58 58.71	58.94	23 27 19.1	19.1	10.399	0.25	1 22.90	46.42	8.97	5 57 35.81		
22	6 3 8.27	8.54	23 27 12.8	12.8	10.396	0.78	1 35.91	46.37	8.97	6 1 32.36		
23	6 7 17.77	18.08	23 26 41.7	41.7	10.393	1.81	1 48.87	46.33	8.97	6 5 28.12		
24	6 11 27.19	27.54	23 25 45.9	45.8	10.390	2.84	2 1.73	46.30	8.96	6 9 25.48		
25	6 15 36.50	36.89	23 24 25.4	25.3	10.385	3.87	2 14.49	46.27	8.94	6 13 22.03		
26	6 19 45.68	46.11	23 22 40.2	40.1	10.379	4.90	2 27.11	46.25	8.92	6 17 18.59		
27	6 23 54.70	55.17	23 20 30.4	30.2	10.372	5.92	2 39.57	46.23	8.90	6 21 15.15		
28	6 28 3.55	4.05	23 17 56.0	55.7	10.364	6.94	2 51.87	46.21	8.88	6 25 11.71		
29	6 32 12.20	12.73	23 14 57.1	56.7	10.355	7.96	3 3.97	46.19	8.85	6 29 8.26		
30	6 36 20.64	21.21	23 11 33.8	33.1	10.346	8.98	3 15.85	46.17	8.82	6 33 4.82		
31	6 40 28.85	29.45	+23 7 46.1	45.5	10.336	9.99	+ 3 27.50	15 46.16	8.79	6 37 1.38		

NOTE. — For Mean Interval of Semidiameter passing the Meridian, subtract 0.18 from the Sidereal Interval.

302 SOLAR EPHEMERIS, 1863.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.			APPARENT DECLINATION.			HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi- diameter at Apparent Noon.	Sidereal Time of Semi-d. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Ap- parent Noon.		Mean Noon.	Ap- parent Noon.		Right Ascen- sion.	Declina- tion.				
	h m s	s		° ' "	"		s	"	m s	' "	m s	h m s
July 1	6 40 28.85	29.45	+23	7 46.1	45.5	10.336	9.99	+ 3 27.50	15' 46.16	1 8.79	6 37 1.38	
2	6 44 36.81	37.44	23	3 34.1	33.4	10.326	11.00	3 38.89	46.16	8.75	6 40 57.94	
3	6 48 44.51	45.17	22	58 58.0	57.2	10.314	12.00	3 50.03	46.16	8.71	6 44 54.49	
4	6 52 51.93	52.62	22	53 57.8	56.9	10.302	13.00	4 0.89	46.16	8.67	6 48 51.05	
5	6 56 59.04	59.76	22	48 33.6	32.6	10.290	14.00	4 11.45	46.16	8.62	6 52 47.61	
6	7 1 5.84	6.59	22	42 45.6	44.5	10.277	14.99	4 21.69	46.17	8.57	6 56 44.17	
7	7 5 12.31	13.09	22	36 33.9	32.7	10.263	15.98	4 31.61	46.18	8.52	7 0 40.72	
8	7 9 18.44	19.25	22	29 58.6	57.3	10.248	16.96	4 41.18	46.20	8.47	7 4 37.28	
9	7 13 24.19	25.02	22	22 59.9	58.5	10.232	17.92	4 50.37	46.22	8.42	7 8 33.84	
10	7 17 29.54	30.40	22	15 38.0	36.5	10.214	18.89	4 59.17	46.25	8.36	7 12 30.39	
11	7 21 34.49	35.37	22	7 53.1	51.5	10.197	19.85	5 7.55	46.28	8.30	7 16 26.96	
12	7 25 39.02	39.92	21	59 45.2	43.5	10.179	20.80	5 15.52	46.32	8.24	7 20 23.51	
13	7 29 43.10	44.01	21	51 14.7	12.8	10.160	21.74	5 23.07	46.36	8.17	7 24 20.06	
14	7 33 46.73	47.66	21	42 21.7	19.7	10.141	22.67	5 30.14	46.41	8.10	7 28 16.62	
15	7 37 49.87	50.82	21	33 6.5	4.2	10.121	23.59	5 36.74	46.47	8.03	7 32 13.17	
16	7 41 52.51	53.48	21	23 29.2	26.8	10.099	24.51	5 42.81	46.53	7.96	7 36 9.73	
17	7 45 54.65	55.63	21	13 30.2	27.7	10.077	25.40	5 48.38	46.60	7.89	7 40 6.29	
18	7 49 56.26	57.25	21	3 9.6	7.0	10.055	26.30	5 53.43	46.67	7.82	7 44 2.85	
19	7 53 57.32	58.32	20	52 27.7	25.0	10.032	27.18	5 57.94	46.74	7.74	7 47 59.40	
20	7 57 57.83	58.84	20	41 24.7	21.9	10.009	28.06	6 1.90	46.82	7.66	7 51 55.96	
21	8 1 57.77	58.79	20	29 60.8	57.9	9.985	28.92	6 5.28	46.91	7.58	7 55 52.51	
22	8 5 57.12	58.15	20	18 16.4	13.4	9.961	29.78	6 8.08	47.00	7.50	7 59 49.07	
23	8 9 55.88	57.91	20	6 11.3	8.2	9.937	30.62	6 10.29	47.09	7.42	8 3 45.63	
24	8 13 54.05	55.08	19	53 46.3	43.1	9.912	31.45	6 11.90	47.18	7.34	8 7 42.18	
25	8 17 51.62	52.65	19	40 61.5	58.2	9.887	32.27	6 12.91	47.28	7.26	8 11 38.74	
26	8 21 48.59	49.62	19	27 57.2	53.8	9.861	33.08	6 13.31	47.39	7.18	8 15 35.30	
27	8 25 44.95	45.98	19	14 33.6	30.1	9.835	33.88	6 13.11	47.50	7.09	8 19 31.86	
28	8 29 40.70	41.72	19	0 50.9	47.3	9.810	34.67	6 12.31	47.61	7.00	8 23 28.41	
29	8 33 35.85	36.86	18	46 49.3	45.7	9.785	35.44	6 10.90	47.73	6.91	8 17 24.96	
30	8 37 30.30	31.39	18	32 2.2	25.5	9.760	36.21	6 8.87	47.85	6.83	8 31 21.52	
31	8 41 24.33	25.32	18	17 50.8	47.0	9.735	36.97	6 6.24	47.97	6.75	8 35 18.07	
Aug. 1	8 45 17.66	18.64	18	2 54.4	50.6	9.710	37.72	6 3.01	48.09	6.66	8 39 14.63	
2	8 49 10.39	11.36	17	47 40.3	36.5	9.685	38.44	5 59.18	48.22	6.57	8 33 11.19	
3	8 53 2.53	3.48	17	32 8.7	4.9	9.661	39.17	5 54.76	48.35	6.48	8 47 7.74	
4	8 56 54.09	55.03	17	16 19.9	16.1	9.636	39.89	5 49.75	48.48	6.40	8 51 4.30	
5	9 0 45.06	45.98	17	0 14.1	10.3	9.612	40.59	5 44.16	48.62	6.32	8 55 0.85	
6	9 4 35.45	36.35	16	43 51.6	47.8	9.588	41.28	5 37.99	48.76	6.23	8 58 57.41	
7	9 8 25.27	26.15	16	27 12.8	9.0	9.564	41.95	5 31.24	48.90	6.14	9 2 53.97	
8	9 12 14.52	15.38	16	10 18.1	14.3	9.540	42.61	5 23.93	49.04	6.05	9 6 50.52	
9	9 16 3.20	4.04	15	53 7.7	3.9	9.517	43.26	5 16.06	49.19	5.96	9 10 47.07	
10	9 19 51.32	52.14	15	35 41.9	38.1	9.493	43.89	5 7.62	49.34	5.88	9 14 43.63	
11	9 23 38.88	39.67	15	17 61.0	57.2	9.470	44.51	4 58.63	49.51	5.80	9 18 40.18	
12	9 27 25.89	26.65	15	0 5.4	1.7	9.447	45.11	4 49.08	49.67	5.72	9 22 36.74	
13	9 31 12.35	13.38	14	41 55.4	51.8	9.424	45.71	4 38.99	49.84	5.64	9 26 33.29	
14	9 34 58.26	58.96	14	23 31.2	27.7	9.501	46.29	4 28.35	50.02	5.56	9 30 29.84	
15	9 38 43.63	44.30	14	4 53.3	49.9	9.379	46.86	4 17.16	50.20	5.48	9 34 26.40	
16	9 42 28.47	21.11	13	45 62.0	58.7	9.357	47.40	4 5.44	50.38	5.40	9 38 22.96	
17	9 46 12.78	13.39	13	26 57.6	54.4	9.335	47.94	3 53.20	50.57	5.32	9 42 19.51	
18	9 49 56.57	57.14	13	7 40.5	37.5	9.314	48.47	3 40.44	50.76	5.25	9 46 16.06	
19	9 53 39.85	40.39	12	48 11.0	8.1	9.293	48.98	3 27.18	50.96	5.18	9 50 12.62	
20	9 57 22.62	23.12	12	28 29.4	26.7	9.272	49.48	3 13.41	51.16	5.11	9 54 9.17	
21	10 1 4.90	5.36	12	8 35.9	33.4	9.252	49.97	2 59.15	51.36	5.04	9 58 5.72	
22	10 4 46.71	47.13	11	48 30.9	28.6	9.232	50.44	2 44.40	51.57	4.97	10 2 2.28	
23	10 8 28.06	28.44	11	28 14.8	12.7	9.213	50.90	2 29.19	51.78	4.91	10 5 58.83	
24	10 12 8.94	9.28	11	7 47.9	46.0	9.194	51.35	2 13.53	51.94	4.85	10 9 55.38	
25	10 15 49.38	49.68	10	47 10.5	8.8	9.176	51.77	1 57.42	52.21	4.79	10 13 51.94	
26	10 19 29.40	29.66	10	26 22.9	21.4	9.159	52.19	1 40.89	52.43	4.73	10 17 48.49	
27	10 23 9.02	9.24	10	5 25.4	24.1	9.143	52.60	1 23.96	52.65	4.67	10 21 45.04	
28	10 26 48.26	48.43	9	44 18.2	17.2	9.127	52.99	1 6.65	52.87	4.62	10 25 41.60	
29	10 30 27.13	27.26	9	23 1.6	0.8	9.112	53.38	0 48.97	53.09	4.57	10 29 38.15	
30	10 34 5.66	5.75	9	1 36.0	3.5	9.098	53.75	0 30.95	53.31	4.52	10 33 34.70	
31	10 37 43.86	43.90	+ 8	40 1.6	1.4	9.084	54.10	+ 0 12.60	53.54	4.47	10 37 31.26	

NOTE. — For Mean Interval of Semidiameter passing the Meridian, subtract 0.18 from the Sidereal Interval.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.			APPARENT DECLINATION.		HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Ap- parent Noon.		Mean Noon.	Ap- parent Noon.	Right Ascension.	Declination.				
Sept. 1	h m s	s		° ' "	"	°	' "	m s	' "	m s	h m s
1	10 41 21.76	21.75	+	8 18 18.8	18.9	9.072	54.44	0 6.05	15 53.77	1 4.42	10 41 27.81
2	10 44 59.37	59.31		7 56 27.9	28.3	9.061	54.78	0 24.99	54.00	4.38	10 45 24.36
3	10 48 36.72	36.61		7 34 29.2	29.9	9.051	55.10	0 44.19	54.23	4.34	10 49 20.92
4	10 52 13.82	13.66		7 12 23.0	24.0	9.041	55.41	1 3.64	54.46	4.30	10 53 17.47
5	10 55 50.69	50.49		6 50 9.7	11.0	9.032	55.69	1 23.31	54.70	4.26	10 57 14.02
6	10 59 27.35	27.09		6 27 49.6	51.2	9.023	55.97	1 43.20	54.94	4.23	11 1 10.57
7	11 3 3.82	3.51		6 5 22.9	24.8	9.015	56.24	2 3.29	55.17	4.20	11 5 7.13
8	11 6 40.12	39.76		5 42 50.0	52.2	9.009	56.49	2 23.53	55.41	4.18	11 9 3.68
9	11 10 16.26	15.85		5 20 11.4	13.9	9.003	56.72	2 43.94	55.65	4.16	11 13 0.23
10	11 13 52.26	51.80		4 57 27.3	30.1	8.997	56.94	3 4.50	55.90	4.14	11 16 56.79
11	11 17 28.13	27.62		4 34 38.1	41.3	8.992	57.14	3 25.18	56.15	4.12	11 20 53.34
12	11 21 3.88	3.32		4 11 44.1	47.7	8.988	57.34	3 45.96	56.41	4.10	11 24 49.89
13	11 24 39.54	38.90		3 48 45.7	49.6	8.984	57.52	4 6.85	56.67	4.09	11 28 46.44
14	11 28 15.13	14.47		3 25 43.2	47.4	8.982	57.68	4 27.80	56.93	4.08	11 32 43.00
15	11 31 50.66	49.97		3 2 37.0	41.6	8.980	57.83	4 48.81	57.19	4.07	11 36 39.55
16	11 35 26.15	25.39		2 39 27.4	32.4	8.978	57.97	5 9.88	57.45	4.06	11 40 36.10
17	11 39 1.61	0.79		2 16 14.8	20.2	8.977	58.08	5 30.96	57.72	4.06	11 44 32.65
18	11 42 37.05	36.18		1 52 59.5	65.2	8.977	58.19	5 52.07	57.99	4.06	11 48 29.21
19	11 46 12.49	11.57		1 29 41.9	47.9	8.978	58.28	6 13.16	58.26	4.07	11 52 25.76
20	11 39 47.97	47.00		1 6 22.3	28.7	8.979	58.36	6 34.23	58.53	4.08	11 56 22.31
21	11 53 23.49	22.46		0 43 1.0	7.8	8.982	58.42	6 55.26	58.81	4.09	12 0 18.86
22	11 56 59.07	57.98	+	0 19 38.4	45.5	8.985	58.47	7 16.22	59.09	4.10	12 4 15.41
23	12 0 34.75	33.61	-	0 3 45.2	37.8	8.989	58.50	7 37.10	59.36	4.12	12 8 11.97
24	12 4 10.54	9.35		0 27 9.5	1.8	8.994	58.52	7 57.86	59.63	4.14	12 12 8.52
25	12 7 46.47	45.23		0 50 34.1	26.1	9.001	58.53	8 18.48	59.91	4.16	12 16 5.07
26	12 11 22.55	21.26		1 13 58.7	50.3	9.008	58.53	8 38.96	16 0.19	4.19	12 20 1.62
27	12 14 58.81	57.46		1 37 23.1	14.3	9.016	58.50	8 59.24	0.47	4.22	12 23 58.18
28	12 18 35.28	33.87		2 0 46.8	37.6	9.024	58.47	9 19.32	0.74	4.25	12 27 54.73
29	12 22 11.98	10.52		2 24 9.6	0.1	9.034	58.42	9 39.17	1.01	4.29	12 31 51.28
30	12 25 48.94	47.43		2 47 31.1	21.3	9.045	58.35	9 58.78	1.28	4.33	12 35 47.84
Oct. 1	12 29 26.17	24.61		3 10 51.0	40.9	9.057	58.28	10 18.09	1.55	4.37	12 39 44.39
2	12 33 3.71	2.10		3 33 68.9	58.5	9.070	58.19	10 37.09	1.83	4.41	12 43 40.94
3	12 36 41.57	39.91		3 57 24.6	13.9	9.084	58.09	10 55.76	2.10	4.46	12 47 37.50
4	12 40 19.77	18.06		4 20 37.6	26.6	9.099	57.97	11 14.11	2.37	4.51	12 51 34.05
5	12 43 58.34	56.58		4 43 47.5	36.2	9.115	57.84	11 32.10	2.64	4.56	12 55 30.60
6	12 47 37.31	35.50		5 6 54.0	42.6	9.132	57.70	11 49.69	2.91	4.61	12 59 27.15
7	12 51 16.69	14.84		5 29 56.8	55.2	9.149	57.53	12 6.87	3.19	4.67	13 3 23.70
8	12 54 56.49	54.59		5 52 55.4	43.6	9.167	57.35	12 23.62	3.46	4.73	13 7 20.25
9	12 58 36.72	34.77		6 15 49.4	37.4	9.186	57.15	12 39.93	3.73	4.80	13 11 16.81
10	13 2 17.42	15.43		6 38 38.5	15.3	9.205	56.93	12 55.79	4.01	4.87	13 15 13.36
11	13 5 58.60	56.57		7 1 22.3	9.9	9.225	56.70	13 11.18	4.29	4.94	13 19 9.92
12	13 9 40.27	38.20		7 23 60.4	47.8	9.246	56.45	13 26.07	4.57	5.01	13 23 6.47
13	13 13 22.44	20.33		7 46 32.4	19.6	9.268	56.20	13 40.44	4.84	5.09	13 27 3.02
14	13 17 5.14	2.09		8 8 57.9	44.7	9.290	55.92	13 54.30	5.11	5.17	13 30 59.57
15	13 20 48.37	46.18		8 31 16.5	3.4	9.312	55.63	14 7.62	5.39	5.25	13 34 56.13
16	13 24 32.15	29.92		8 53 27.8	14.6	9.335	55.31	14 20.40	5.67	5.33	13 38 52.68
17	13 28 16.49	14.22		9 15 31.4	18.1	9.359	54.98	14 32.62	5.95	5.42	13 42 49.23
18	13 31 61.41	59.10		9 37 26.9	13.5	9.384	54.64	14 44.25	6.22	5.51	13 46 45.79
19	13 35 46.92	44.57		9 58 74.0	60.5	9.410	54.28	14 55.29	6.49	5.60	13 50 42.34
20	13 39 33.05	30.67		10 20 52.2	38.6	9.436	53.90	15 5.72	6.77	5.69	13 54 38.89
21	13 43 19.80	17.39		10 42 21.2	7.5	9.462	53.51	15 15.53	7.05	5.78	13 58 35.44
22	13 47 7.20	4.76		11 3 40.6	26.9	9.489	53.10	15 24.69	7.33	5.88	14 2 32.00
23	13 50 55.25	52.78		11 24 49.9	36.2	9.517	52.68	15 33.19	7.60	5.98	14 6 28.55
24	13 54 43.98	41.48		11 45 48.9	35.2	9.545	52.24	15 41.01	7.87	6.08	14 10 25.10
25	13 58 33.40	30.87		12 6 37.1	23.4	9.574	51.78	15 48.15	8.14	6.18	14 14 21.66
26	14 2 23.54	20.98		12 27 14.2	0.6	9.605	51.31	15 54.58	8.41	6.29	14 18 18.21
27	14 6 14.41	11.83		12 47 39.7	26.1	9.636	50.81	16 0.28	8.66	6.40	14 22 14.77
28	14 10 6.02	3.43		13 7 53.3	39.8	9.667	50.31	16 5.23	8.91	6.51	14 26 11.32
29	14 13 58.39	55.78		13 27 54.5	41.1	9.699	49.79	16 9.43	9.16	6.62	14 30 7.87
30	14 17 51.54	48.91		13 47 43.0	29.7	9.731	49.26	16 12.85	9.41	6.73	14 34 4.43
31	14 21 45.48	42.83		14 7 18.5	5.3	9.764	48.70	16 15.48	9.66	6.84	14 38 0.98
32	14 25 40.22	37.56	-	14 26 40.5	27.4	9.798	48.13	16 17.30	9.91	6.95	14 41 57.54

NOTE.—For Mean Interval of Semidiameter passing the Meridian, subtract 0s 18 from the Sidereal Interval.

304 SOLAR EPHEMERIS, 1863.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.				
Nov. 1	14 25 40.22	37.56	14 26 40.5	27.4	9.798	48.13	16 17.30	16 9.91	6.95	14 41 57.54
2	14 29 35.79	33.12	14 45 48.5	35.5	9.833	47.54	16 18.30	10.15	7.06	14 45 54.09
3	14 33 32.19	29.51	15 4 42.2	29.4	9.867	46.94	16 18.46	10.39	7.18	14 49 50.64
4	14 37 29.42	26.73	15 23 21.1	8.5	9.902	46.31	16 17.79	10.63	7.30	14 53 47.19
5	14 41 27.50	24.80	15 41 44.9	32.5	9.937	45.68	16 16.28	10.87	7.42	14 57 43.75
6	14 45 26.42	23.72	15 59 53.1	50.9	9.972	45.01	16 13.93	11.10	7.54	15 1 40.31
7	14 49 26.19	23.49	16 17 45.3	33.3	10.008	44.34	16 10.72	11.33	7.65	15 5 36.86
8	14 53 26.81	24.11	16 35 21.1	9.3	10.043	43.65	16 6.65	11.56	7.77	15 9 33.42
9	14 57 28.29	25.59	16 52 40.2	28.6	10.079	42.94	16 1.74	11.79	7.89	15 13 29.97
10	15 1 30.62	27.93	17 9 42.0	30.7	10.115	42.21	15 55.98	12.02	8.01	15 17 26.53
11	15 5 33.81	31.13	17 26 26.1	15.0	10.150	41.46	15 49.36	12.24	8.13	15 21 23.08
12	15 9 37.84	35.17	17 42 52.1	41.3	10.185	40.68	15 41.89	12.46	8.25	15 25 19.64
13	15 13 42.72	40.06	17 58 59.7	49.2	10.220	39.92	15 33.58	12.68	8.37	15 29 16.20
14	15 17 48.43	45.79	18 14 48.4	38.2	10.255	39.13	15 24.43	12.90	8.49	15 33 12.75
15	15 21 54.97	52.37	18 30 17.9	8.0	10.289	38.31	15 14.45	13.11	8.61	15 37 9.31
16	15 25 62.34	59.74	18 45 27.7	18.1	10.324	37.49	15 3.64	13.32	8.73	15 41 5.86
17	15 30 10.54	7.97	19 0 17.5	8.2	10.358	36.65	14 52.00	13.53	8.85	15 45 2.42
18	15 34 19.56	17.02	19 14 46.8	37.8	10.392	35.79	14 39.55	13.74	8.96	15 48 58.97
19	15 38 29.38	27.88	19 28 55.3	46.6	10.425	34.91	14 26.20	13.95	9.07	15 52 55.53
20	15 42 39.99	37.52	19 42 42.6	34.3	10.458	34.02	14 12.23	14.15	9.18	15 56 52.08
21	15 46 51.39	48.95	19 56 8.4	0.5	10.491	33.12	13 57.40	14.35	9.29	16 0 48.64
22	15 51 3.57	1.17	20 9 12.3	4.8	10.524	32.21	13 41.77	14.54	9.40	16 4 45.20
23	15 55 16.54	14.18	20 21 54.0	46.9	10.556	31.27	13 25.36	14.73	9.51	16 8 41.75
24	15 59 30.28	27.96	20 34 13.1	6.4	10.588	30.32	13 8.19	14.91	9.62	16 12 38.31
25	16 3 44.78	42.51	20 46 9.2	2.8	10.620	29.36	12 50.25	15.09	9.73	16 16 34.87
26	16 7 60.03	57.81	20 57 42.1	36.0	10.651	28.38	12 31.56	15.26	9.83	16 20 31.42
27	16 12 16.02	13.83	21 8 51.4	45.7	10.681	27.39	12 12.13	15.42	9.93	16 24 27.98
28	16 16 32.74	30.62	21 19 36.9	31.6	10.711	26.39	11 51.96	15.58	10.02	16 28 24.54
29	16 20 50.17	48.11	21 29 58.2	53.2	10.742	25.38	11 31.08	15.74	10.13	16 32 21.09
30	16 25 8.30	6.30	21 39 54.9	50.2	10.770	24.35	11 13.51	15.89	10.22	16 36 17.65
Dec. 1	16 29 27.12	25.18	21 49 26.9	22.5	10.798	23.31	10 47.26	16.04	10.31	16 40 14.20
2	16 33 46.59	44.71	21 58 33.7	29.7	10.825	22.26	10 24.34	16.19	10.39	16 44 10.76
3	16 38 6.71	4.90	22 7 15.2	11.5	10.851	21.19	10 0.79	16.33	10.47	16 48 7.32
4	16 42 27.45	25.71	22 15 31.0	27.6	10.876	20.12	9 36.61	16.46	10.55	16 52 3.88
5	16 46 48.78	47.12	22 23 20.9	17.8	10.901	19.04	9 11.84	16.59	10.63	16 56 0.43
6	16 51 10.67	9.08	22 30 44.6	41.8	10.924	17.94	8 46.49	16.71	10.70	16 59 56.99
7	16 55 33.10	31.58	22 37 42.0	39.5	10.945	16.84	8 20.62	16.83	10.76	17 3 53.55
8	16 59 56.04	54.60	22 44 12.7	10.5	10.965	15.71	7 54.24	16.94	10.82	17 7 50.11
9	17 4 19.45	18.09	22 50 16.6	14.7	10.985	14.59	7 27.38	17.05	10.88	17 11 46.66
10	17 8 43.31	42.03	22 55 53.5	51.9	11.003	13.47	7 0.07	17.16	10.94	17 15 43.22
11	17 13 7.58	6.38	23 1 3.2	1.8	11.019	12.34	6 32.36	17.27	11.00	17 19 39.78
12	17 17 32.22	31.10	23 5 45.5	44.3	11.034	11.19	6 4.27	17.38	11.05	17 23 36.34
13	17 21 57.19	56.15	23 9 60.2	59.1	11.048	10.04	5 35.83	17.48	11.09	17 27 32.89
14	17 26 22.48	21.53	23 13 47.3	46.5	11.059	8.88	5 7.10	17.58	11.13	17 31 29.45
15	17 30 48.04	47.18	23 17 6.6	6.0	11.070	7.72	4 38.09	17.67	11.17	17 35 26.01
16	17 35 13.83	13.06	23 19 58.0	57.5	11.079	6.56	4 8.84	17.76	11.21	17 39 22.57
17	17 39 39.81	39.13	23 22 21.5	21.1	11.086	5.39	3 39.40	17.84	11.23	17 43 19.12
18	17 44 5.95	5.36	23 24 16.8	16.5	11.092	4.22	3 9.81	17.92	11.25	17 47 15.68
19	17 48 32.22	31.72	23 25 43.9	43.7	11.097	3.04	2 40.09	18.00	11.27	17 51 12.24
20	17 52 58.59	58.18	23 26 42.8	42.7	11.100	1.86	2 10.26	18.06	11.29	17 55 8.80
21	17 57 25.03	24.71	23 27 13.5	13.5	11.102	0.69	1 40.36	18.12	11.30	17 59 5.35
22	18 1 51.50	50.28	23 27 15.9	15.9	11.102	0.49	1 10.44	18.18	11.30	18 3 1.91
23	18 6 17.97	17.84	23 26 50.0	50.0	11.102	1.67	0 40.52	18.23	11.30	18 6 58.47
24	18 10 44.42	44.38	23 25 55.9	55.9	11.100	2.85	0 10.62	18.26	11.30	18 10 55.03
25	18 15 10.81	10.86	23 24 33.5	33.5	11.097	4.02	+ 0 19.23	18.32	11.29	18 14 51.58
26	18 19 37.11	37.26	23 22 42.9	42.9	11.093	5.20	+ 0 48.98	18.36	11.27	18 18 48.14
27	18 24 3.30	3.54	23 20 24.1	24.0	11.087	6.37	1 18.61	18.37	11.25	18 22 44.70
28	18 28 29.33	29.66	23 17 37.1	36.9	11.080	7.54	1 48.10	18.39	11.22	18 26 41.25
29	18 32 55.19	55.61	23 14 22.1	21.8	11.073	8.70	2 17.41	18.40	11.19	18 30 37.81
30	18 37 20.84	21.35	23 10 39.0	38.6	11.064	9.86	2 36.55	18.41	11.16	18 34 34.37
31	18 41 46.26	46.86	23 6 28.1	27.5	11.053	11.02	3 15.38	18.41	11.13	18 38 30.92
32	18 46 11.41	12.10	23 1 49.4	48.6	11.041	12.18	+ 3 43.98	18.41	11.09	18 42 27.48

NOTE.—For Mean Interval of Semidiameter passing the Meridian, subtract 0.18 from the Sidereal Interval.

MOON CULMINATIONS, 1863. 305

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
Jan. 0	0	I. L.	3 50 31.03	2.11846	66.09	+21° 53' 7.8"	+2.30658
1	1	I. U.	4 25 54.09	2.12156	66.24	+22 25 42.0	+2.08909
1	1	I. L.	4 59 23.97	2.12284	66.31	+22 42 7.6	+1.61752
2	2	I. U.	5 13 56.01	2.12254	66.25	+22 42 11.8	-1.60821
2	2	I. L.	5 45 24.89	2.12090	66.10	+22 25 55.7	-2.08576
3	3	I. U.	6 11 45.65	2.11793	65.85	+21 53 35.0	-2.30371
3	3	I. L.	6 37 53.51	2.11381	65.53	+21 5 38.8	-2.44370
4	4	II. U.	7 5 54.99	2.10863	65.13	+20 2 48.7	-2.54439
5	4	II. L.	7 31 25.95	2.10281	64.69	+18 45 57.5	-2.62090
5	5	II. U.	7 56 35.97	2.09674	64.23	+17 16 7.5	-2.68120
6	5	II. L.	8 21 24.93	2.09072	63.79	+15 34 25.3	-2.72941
6	6	II. U.	8 45 54.05	2.08515	63.38	+13 42 3.8	-2.76827
7	6	II. L.	9 10 5.68	2.08037	63.06	+11 40 17.6	-2.79950
7	7	II. U.	9 34 3.13	2.07675	62.80	+9 30 22.9	-2.82466
8	7	II. L.	9 57 50.79	2.07445	62.67	+7 13 37.4	-2.84432
8	8	II. U.	10 21 33.96	2.07307	62.66	+4 51 18.7	-2.85927
9	8	II. L.	10 45 18.62	2.07536	62.80	+2 24 46.3	-2.86986
9	9	II. U.	11 9 11.19	2.07882	63.08	-0 4 38.0	-2.87616
10	9	II. L.	11 33 18.71	2.08443	63.52	-2 35 29.9	-2.87823
10	10	II. U.	11 57 48.80	2.09226	64.13	-5 6 17.9	-2.87584
11	11	II. L.	12 22 49.23	2.10216	64.91	-7 35 23.7	-2.86838
11	11	II. U.	12 48 27.87	2.11401	65.84	-10 1 0.4	-2.85502
12	12	II. L.	13 14 52.33	2.12762	66.92	-12 21 7.5	-2.83455
12	12	II. U.	13 42 9.79	2.14251	68.12	-14 33 29.7	-2.80513
13	13	II. L.	14 10 26.27	2.15824	69.39	-16 35 38.1	-2.76306
13	13	II. U.	14 39 45.95	2.17412	70.72	-18 24 52.2	-2.70693
14	14	II. L.	15 10 10.18	2.18952	71.99	-19 58 21.3	-2.62645
14	14	II. U.	15 41 37.12	2.20303	73.17	-21 13 8.6	-2.50821
15	15	II. L.	16 14 0.00	2.21468	74.17	-22 6 26.7	-2.31901
15	15	II. U.	16 47 8.19	2.22321	74.88	-22 35 52.8	-1.92603
16	16	II. L.	17 20 47.27	2.22807	75.29	-22 39 41.2	+1.67191
16	16	II. U.	17 54 39.71	2.22894	75.33	-22 16 55.8	+2.25588
17	17	II. L.	18 28 26.74	2.22583	75.03	-21 27 43.3	+2.49179
17	17	II. U.	19 1 50.77	2.21911	74.42	-20 13 15.7	+2.63555
18	18	I. L.	19 32 10.13	2.20949	73.55	-18 35 38.2	+2.73366
19	18	I. U.	20 4 10.55	2.19772	72.52	-16 37 42.5	+2.80265
19	19	I. L.	20 35 16.68	2.18461	71.40	-14 22 51.3	+2.85154
20	19	I. U.	21 5 26.21	2.17108	70.26	-11 54 42.8	+2.88529
20	20	I. L.	21 34 40.34	2.15770	69.18	-9 16 51.7	+2.90718
21	20	I. U.	22 3 3.04	2.14510	68.18	-6 32 45.1	+2.92016
21	21	I. L.	22 30 39.91	2.13421	67.30	-3 45 33.9	+2.92367
22	21	I. U.	22 57 37.57	2.12476	66.57	-0 58 8.8	+2.92084
22	22	I. L.	23 24 3.37	2.11707	66.00	+1 47 0.5	+2.91187
23	22	I. U.	23 50 4.43	2.11123	65.58	+4 27 43.2	+2.89713
23	23	I. L.	0 15 47.77	2.10731	65.30	+7 2 6.5	+2.87707
24	24	I. U.	0 41 20.12	2.10510	65.15	+9 28 34.7	+2.85128
24	24	I. L.	1 6 47.40	2.10448	65.12	+11 45 43.2	+2.81972
25	25	I. U.	1 32 14.69	2.10527	65.19	+13 52 18.6	+2.78156
25	25	I. L.	1 57 46.24	2.10637	65.34	+15 47 15.2	+2.73562
26	26	I. U.	2 23 25.24	2.10944	65.54	+17 29 34.6	+2.68010

306 MOON CULMINATIONS, 1863.

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	d		^h ^m ^s		^s	[°] ['] ["]	
Jan. 26	26	I. L.	2 49 13.73	2.11230	65.77	+18 58 24.5	+2.61185
27	27	I. U.	3 15 12.77	2.11531	65.98	+20 12 59.8	+2.52633
27	27	I. L.	3 41 22.18	2.11796	66.16	+21 12 37.5	+2.41484
28	28	I. U.	4 7 40.43	2.12008	66.30	+21 56 47.4	+2.25857
28	28	I. L.	4 34 5.22	2.12140	66.38	+22 25 4.2	+2.00535
29	29	I. U.	5 0 33.22	2.12179	66.38	+22 37 11.2	+1.30060
29	29	I. L.	5 27 1.03	2.12107	66.28	+22 33 3.6	-1.78739
30	30	I. U.	5 53 24.27	2.11926	66.10	+22 12 48.3	-2.14956
30	30	I. L.	6 19 38.87	2.11641	65.84	+21 36 42.7	-2.34092
31	31	I. U.	6 45 41.45	2.11251	65.50	+20 45 15.2	-2.46931
Feb. 31	31	I. L.	7 11 29.14	2.10796	65.12	+19 39 5.7	-2.56361
1	32	I. U.	7 36 59.77	2.10292	64.69	+18 19 4.8	-2.63666
1	32	I. L.	8 2 12.31	2.09771	64.28	+16 46 10.0	-2.69464
2	33	I. U.	8 27 7.09	2.09265	63.88	+15 1 26.1	-2.74124
2	33	I. L.	8 51 44.91	2.08792	63.51	+13 6 5.2	-2.77893
3	34	II. U.	9 18 14.48	2.08408	63.22	+11 1 23.9	-2.80935
4	34	II. L.	9 42 25.59	2.08117	63.00	+ 8 48 41.2	-2.83333
4	35	II. U.	10 6 29.08	2.07961	62.89	+ 6 29 20.2	-2.85179
5	35	II. L.	10 30 29.64	2.07943	62.89	+ 4 4 46.7	-2.86533
5	36	II. U.	10 54 32.48	2.08095	63.02	+ 1 36 29.8	-2.87394
6	36	II. L.	11 18 43.32	2.08426	63.30	- 0 53 57.6	-2.87794
6	37	II. U.	11 43 8.43	2.08941	63.72	- 3 24 58.4	-2.87714
7	38	II. L.	12 7 54.12	2.09639	64.27	- 5 54 52.8	-2.87149
7	38	II. U.	12 33 6.99	2.10507	64.97	- 8 21 54.0	-2.86094
8	39	II. L.	12 58 53.41	2.11541	65.80	-10 44 8.8	-2.84263
8	39	II. U.	13 25 19.74	2.12717	66.76	-12 59 36.0	-2.81744
9	40	II. L.	13 52 31.46	2.13985	67.79	-15 6 6.8	-2.78277
9	40	II. U.	14 20 32.61	2.15302	68.89	-17 1 23.6	-2.73590
10	41	II. L.	14 49 26.03	2.16631	69.99	-18 43 4.2	-2.67260
10	41	II. U.	15 19 12.32	2.17901	71.07	-20 8 44.6	-2.58488
11	42	II. L.	15 49 48.92	2.19030	72.05	-21 16 3.3	-2.45783
11	42	II. U.	16 21 10.58	2.19992	72.90	-22 2 48.1	-2.25249
12	43	II. L.	16 53 8.46	2.20707	73.48	-22 27 8.4	-1.79865
12	43	II. U.	17 25 31.37	2.21117	73.81	-22 27 44.2	+1.76230
13	44	II. L.	17 58 5.92	2.21211	73.88	-22 3 54.2	+2.25665
13	44	II. U.	18 30 38.16	2.21002	73.67	-21 15 41.7	+2.47815
14	45	II. L.	19 2 54.86	2.20523	73.21	-20 3 58.7	+2.61794
14	45	II. U.	19 34 44.57	2.19800	72.55	-18 30 20.4	+2.71546
15	46	II. L.	20 5 58.77	2.18904	71.74	-16 37 2.8	+2.78618
15	46	II. U.	20 36 32.09	2.17892	70.86	-14 26 48.4	+2.83790
16	47	II. L.	21 6 22.03	2.16838	69.95	-12 2 40.1	+2.87507
16	47	II. U.	21 35 29.07	2.15794	69.07	- 9 27 51.1	+2.90052
17	48	I. L.	22 1 38.34	2.14820	68.26	- 6 45 35.1	+2.91635
18	48	I. U.	22 29 31.34	2.13941	67.55	- 3 58 58.6	+2.92363
18	49	I. L.	22 56 52.29	2.13197	66.96	- 1 11 0.6	+2.92360
19	49	I. U.	23 23 47.62	2.12597	66.51	+ 1 35 36.6	+2.91673
19	50	I. L.	23 50 23.26	2.12146	66.17	+ 4 18 25.7	+2.90349
20	51	I. U.	0 16 44.86	2.11840	65.96	+ 6 55 14.4	+2.88406
20	51	I. L.	0 42 57.62	2.11668	65.85	+ 9 24 5.9	+2.85825
21	52	I. U.	1 9 6.28	2.11614	65.84	+11 43 19.9	+2.83583

MOON CULMINATIONS, 1863. 307

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		^{h m s}		^s	^{° ' "}	
Feb. 21	52	I. L.	1 35 14.65	2.11661	65.90	+13 51 28.2	+2.78604
22	53	I. U.	2 1 25.69	2.11767	66.03	+15 47 15.3	+2.73759
22	53	I. L.	2 27 41.73	2.11923	66.17	+17 29 36.8	+2.67830
23	54	I. U.	2 54 3.54	2.12090	66.34	+18 57 39.0	+2.60552
23	54	I. L.	3 20 31.29	2.12238	66.48	+20 10 38.7	+2.51374
24	55	I. U.	3 47 4.04	2.12349	66.58	+21 8 2.6	+2.39292
24	55	I. L.	4 13 39.97	2.12402	66.63	+21 49 26.4	+2.22149
25	56	I. U.	4 40 16.57	2.12382	66.60	+22 14 36.4	+1.93008
25	56	I. L.	5 6 50.77	2.12267	66.51	+22 23 29.4	+0.57054
26	57	I. U.	5 33 19.44	2.12060	66.34	+22 16 8.7	-1.88530
26	57	I. L.	5 59 39.48	2.11783	66.10	+21 52 51.4	-2.19229
27	58	I. U.	6 25 48.05	2.11428	65.79	+21 14 1.9	-2.36560
27	58	I. L.	6 51 42.80	2.11015	65.43	+20 20 12.9	-2.48487
28	59	I. U.	7 17 22.16	2.10568	65.04	+19 12 4.6	-2.57405
28	59	I. L.	7 42 45.34	2.10099	64.65	+17 50 24.6	-2.64406
Mar. 1	60	I. U.	8 7 52.54	2.09653	64.26	+16 16 7.5	-2.70021
1	60	I. L.	8 32 44.73	2.09241	63.92	+14 30 13.0	-2.74564
2	61	I. U.	8 57 23.87	2.08898	63.63	+12 33 46.4	-2.78289
2	61	I. L.	9 21 52.70	2.08643	63.40	+10 27 57.8	-2.81312
3	62	I. U.	9 46 14.66	2.08507	63.27	+ 8 14 3.2	-2.83738
3	62	I. L.	10 10 33.85	2.08497	63.24	+ 5 53 24.6	-2.85596
4	63	I. U.	10 34 54.85	2.08629	63.32	+ 3 27 28.4	-2.86946
5	63	II. L.	11 1 29.79	2.08920	63.54	+ 0 57 48.1	-2.87785
5	64	II. U.	11 26 10.64	2.09370	63.88	- 1 33 57.8	-2.88137
6	64	II. L.	11 51 9.69	2.09979	64.35	- 4 6 0.2	-2.87959
6	65	II. U.	12 16 32.67	2.10741	64.95	- 6 36 26.4	-2.87211
7	66	II. L.	12 42 25.06	2.11641	65.66	- 9 3 15.3	-2.85834
7	66	II. U.	13 8 52.33	2.12662	66.49	-11 24 18.4	-2.83712
8	67	II. L.	13 35 58.86	2.13761	67.39	-13 37 21.0	-2.80710
8	67	II. U.	14 3 47.90	2.14900	68.36	-15 40 2.8	-2.76625
9	68	II. L.	14 32 21.78	2.16050	69.33	-17 30 4.3	-2.71147
9	68	II. U.	15 1 40.75	2.17146	70.27	-19 5 5.8	-2.63736
10	69	II. L.	15 31 42.35	2.18127	71.13	-20 22 52.7	-2.53445
10	69	II. U.	16 2 22.01	2.18952	71.86	-21 21 24.3	-2.38283
11	70	II. L.	16 33 32.54	2.19568	72.41	-21 58 59.7	-2.12529
11	70	II. U.	17 5 4.46	2.19968	72.75	-22 14 23.3	-1.30276
12	71	II. L.	17 36 46.88	2.20047	72.85	-22 6 52.8	+1.97841
12	71	II. U.	18 8 28.30	2.19888	72.72	-21 36 21.7	+2.32094
13	72	II. L.	18 39 57.64	2.19490	72.36	-20 43 21.9	+2.50481
13	72	II. U.	19 11 5.32	2.18901	71.82	-19 28 59.6	+2.62664
14	73	II. L.	19 41 43.86	2.18139	71.16	-17 54 52.9	+2.71331
14	73	II. U.	20 11 48.28	2.17277	70.40	-16 3 6.1	+2.77752
15	74	II. L.	20 41 16.22	2.16415	69.60	-13 55 59.8	+2.82579
15	74	II. U.	21 10 7.62	2.15479	68.82	-11 36 9.5	+2.86138
16	75	II. L.	21 38 24.43	2.14632	68.10	- 9 6 16.6	+2.88648
16	75	II. U.	22 6 10.08	2.13875	67.45	- 6 29 4.9	+2.90296
17	76	II. L.	22 33 29.02	2.13226	66.90	- 3 47 17.3	+2.91170
17	76	II. U.	23 0 26.29	2.12707	66.48	- 1 3 32.8	+2.91339
18	77	II. L.	23 27 7.21	2.12346	66.18	+ 1 39 37.1	+2.90866
19	77	I. U.	23 1 25.04	2.12113	65.99	+ 4 19 49.1	+2.89753

308 MOON CULMINATIONS, 1863.

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Translt.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		^{h m s}		^s	^{° ' "}	
Mar. 19	78	I. L.	0 17 48.86	2.12002	65.92	+ 6 54 48.2	+2.87983
20	79	I. U.	0 46 10.64	2.12008	65.93	+ 9 22 28.9	+2.85541
20	79	I. L.	1 10 34.09	2.12097	66.01	+11 40 58.1	+2.82388
21	80	I. U.	1 37 2.08	2.12251	66.15	+13 48 35.9	+2.78429
21	80	I. L.	2 3 36.39	2.12130	66.33	+15 43 54.0	+2.73527
22	81	I. U.	2 30 17.71	2.12636	66.52	+17 25 35.6	+2.67453
22	81	I. L.	2 57 5.71	2.12778	66.68	+18 52 38.1	+2.59670
23	82	I. U.	3 23 59.15	2.12915	66.81	+20 4 12.4	+2.50255
23	82	I. L.	3 50 55.54	2.12953	66.88	+20 59 42.7	+2.37420
24	83	I. U.	4 17 51.89	2.12908	66.88	+21 38 48.1	+2.18772
24	83	I. L.	4 44 44.80	2.12759	66.79	+22 1 19.4	+1.85242
25	84	I. U.	5 11 30.75	2.12513	66.62	+22 7 21.0	-1.04336
25	84	I. L.	5 38 5.94	2.12169	66.36	+21 57 7.9	-1.95966
26	85	I. U.	6 4 27.37	2.11753	66.04	+21 31 5.1	-2.22707
26	85	I. L.	6 30 32.67	2.11281	65.68	+20 49 46.8	-2.38661
27	86	I. U.	6 56 20.22	2.10765	65.26	+19 53 53.0	-2.49831
27	86	I. L.	7 21 49.36	2.10243	64.85	+18 44 9.2	-2.58197
28	87	I. U.	7 47 0.45	2.09740	64.44	+17 21 26.3	-2.64799
28	87	I. L.	8 11 54.71	2.09279	64.07	+15 46 38.0	-2.70132
29	88	I. U.	8 36 34.38	2.08895	63.74	+14 0 40.9	-2.74509
29	88	I. L.	9 1 2.45	2.08607	63.49	+12 4 34.6	-2.78115
30	89	I. U.	9 25 22.70	2.08447	63.33	+ 9 59 22.7	-2.81078
30	89	I. L.	9 49 39.55	2.08422	63.28	+ 7 46 13.0	-2.83480
31	90	I. U.	10 13 57.86	2.08551	63.34	+ 5 26 18.8	-2.85377
31	90	I. L.	10 38 23.08	2.08846	63.52	+ 3 1 0.1	-2.86786
April 1	91	I. U.	11 3 0.90	2.09311	63.85	+ 0 31 44.6	-2.87706
1	91	I. L.	11 27 57.30	2.09948	64.29	- 1 59 49.9	-2.88121
2	92	I. U.	11 53 18.31	2.10741	64.89	- 4 31 55.2	-2.87987
2	93	I. L.	12 19 9.87	2.11681	65.61	- 7 2 31.4	-2.87248
3	93	II. U.	12 47 50.49	2.12746	66.44	- 9 29 27.4	-2.85828
4	94	II. L.	13 15 1.15	2.13899	67.36	-11 50 21.0	-2.83588
4	94	II. U.	13 42 56.89	2.15100	68.34	-14 2 39.6	-2.80324
5	95	II. L.	14 11 39.85	2.16304	69.35	-16 3 46.1	-2.75829
5	95	II. U.	14 41 10.29	2.17455	70.33	-17 51 1.4	-2.69662
6	96	II. L.	15 11 25.93	2.18484	71.24	-19 21 51.8	-2.61180
6	96	II. U.	15 42 21.54	2.19340	72.00	-20 33 56.7	-2.49142
7	97	II. L.	16 13 49.20	2.19968	72.55	-21 25 18.2	-2.39596
7	97	II. U.	16 45 38.62	2.20333	72.89	-21 54 26.7	-1.94680
8	98	II. L.	17 17 37.77	2.20407	73.04	-22 0 31.8	+1.44420
8	98	II. U.	17 49 33.81	2.20194	72.92	-21 43 22.1	+2.15655
9	99	II. L.	18 21 14.49	2.19720	72.53	-21 3 27.2	+2.40634
9	99	II. U.	18 52 29.38	2.19013	71.96	-20 1 54.3	+2.55546
10	100	II. L.	19 23 10.42	2.18144	71.21	-18 40 21.7	+2.65734
10	100	II. U.	19 53 12.39	2.17158	70.33	-17 0 51.6	+2.73124
11	101	II. L.	20 22 32.99	2.16134	69.46	-15 5 40.4	+2.78623
11	101	II. U.	20 51 12.56	2.15122	68.61	-12 57 10.7	+2.82707
12	102	II. L.	21 19 13.42	2.14167	67.81	-10 37 52.6	+2.85694
12	102	II. U.	21 46 39.57	2.13319	67.10	- 8 10 14.9	+2.87799
13	103	II. L.	22 13 36.26	2.12507	66.49	- 5 36 40.2	+2.89146
13	103	II. U.	22 40 9.27	2.12034	66.01	- 2 59 29.0	+2.89626

MOON CULMINATIONS, 1863. 309

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
April 14	^a 104	II. L.	^b 23 ^m 6 ^s 24.76	2.11641	^c 65.66	— 0° 20' 58.3"	+2.89881
14	104	II. U.	23 32 28.73	2.11397	65.44	+ 2 16 41.8	+2.89358
15	105	II. L.	23 58 26.92	2.11317	65.34	+ 4 51 25.9	+2.88221
15	106	II. U.	0 24 24.72	2.11371	65.37	+ 7 21 12.5	+2.86494
16	106	II. L.	0 50 26.58	2.11535	65.49	+ 9 44 6.0	+2.84135
16	107	II. U.	1 16 36.08	2.11790	65.67	+11 58 17.5	+2.81049
17	107	I. L.	1 40 44.05	2.12100	65.90	+14 2 5.9	+2.77117
18	108	I. U.	2 7 15.04	2.12424	66.16	+15 53 58.4	+2.72200
18	108	I. L.	2 33 57.80	2.12730	66.42	+17 32 32.0	+2.66032
19	109	I. U.	3 0 51.15	2.12968	66.65	+18 56 36.2	+2.58259
19	109	I. L.	3 27 52.74	2.13162	66.81	+20 5 15.6	+2.48205
20	110	I. U.	3 54 59.16	2.13232	66.90	+20 57 49.3	+2.34555
20	110	I. L.	4 22 6.92	2.13191	66.90	+21 33 51.2	+2.14114
21	111	I. U.	4 49 9.13	2.13011	66.80	+21 53 11.5	+1.74084
21	111	I. L.	5 16 3.25	2.12700	66.60	+21 55 56.3	—1.43616
22	112	I. U.	5 42 44.07	2.12280	66.30	+21 42 25.8	—2.03048
22	112	I. L.	6 9 7.81	2.11767	65.92	+21 13 11.0	—2.26569
23	113	I. U.	6 35 11.63	2.11177	65.50	+20 28 54.0	—2.41130
23	113	I. L.	7 0 53.82	2.10554	65.04	+19 30 22.9	—2.51406
24	114	I. U.	7 26 13.85	2.09927	64.57	+18 18 31.4	—2.59199
24	114	I. L.	7 51 12.42	2.09325	64.12	+16 54 15.3	—2.65398
25	115	I. U.	8 15 51.35	2.08792	63.71	+15 18 32.5	—2.70377
25	115	I. L.	8 40 13.44	2.08346	63.36	+13 32 21.5	—2.74478
26	116	I. U.	9 4 22.40	2.08023	63.11	+11 36 41.6	—2.77850
26	116	I. L.	9 28 22.83	2.07846	62.97	+ 9 32 33.1	—2.80629
27	117	I. U.	9 52 19.94	2.07839	62.95	+ 7 20 58.3	—2.82908
27	117	I. L.	10 16 19.50	2.08012	63.04	+ 5 3 2.0	—2.84724
28	118	I. U.	10 40 27.78	2.08386	63.29	+ 2 39 56.2	—2.86089
28	118	I. L.	11 4 51.43	2.08952	63.69	+ 0 12 58.5	—2.87039
29	119	I. U.	11 29 37.33	2.09709	64.22	— 2 16 25.3	—2.87533
29	119	I. L.	11 44 52.53	2.10660	64.92	— 4 46 35.1	—2.87488
30	120	I. U.	12 20 44.12	2.11777	65.76	— 7 15 37.1	—2.86857
30	121	I. L.	12 47 18.76	2.13033	66.70	— 9 41 23.9	—2.85545
May 1	121	I. U.	13 14 42.16	2.14398	67.78	—12 1 31.3	—2.83388
1	122	I. L.	13 42 59.00	2.15815	68.92	—14 13 20.4	—2.80181
2	122	I. U.	14 12 12.05	2.17214	70.08	—16 13 59.9	—2.75624
2	123	II. L.	14 44 43.92	2.18540	71.19	—18 0 32.8	—2.69240
3	123	II. U.	15 15 48.87	2.19722	72.21	—19 30 3.6	—2.60249
4	124	II. L.	15 47 40.33	2.20672	73.06	—20 39 50.7	—2.47063
4	124	II. U.	16 20 7.94	2.21339	73.67	—21 27 37.9	—2.25718
5	125	II. L.	16 52 58.26	2.21666	74.00	—21 51 46.7	—1.77815
5	125	II. U.	17 25 55.86	2.21659	74.02	—21 51 26.5	+1.80072
6	126	II. L.	17 58 44.73	2.21291	73.74	—21 26 38.6	+2.26487
6	126	II. U.	18 31 10.16	2.20621	73.16	—20 38 15.1	+2.47491
7	127	II. L.	19 2 59.92	2.19697	72.37	—19 27 52.3	+2.60574
7	127	II. U.	19 34 5.28	2.18589	71.47	—17 57 40.9	+2.69573
8	128	II. L.	20 4 21.15	2.17377	70.48	—16 10 13.2	+2.76037
8	128	II. U.	20 33 46.04	2.16131	69.45	—14 8 12.1	+2.80746
9	129	II. L.	21 2 21.53	2.14922	68.47	—11 54 22.6	+2.84144
9	129	II. U.	21 30 11.42	2.13799	67.56	— 9 31 24.6	+2.86525

310 MOON CULMINATIONS, 1863.

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	d		^h ^m ^s		^s	[°] ['] ["]	
May 10	130	II. L.	21 57 21.21	2.12818	66.76	- 7 1 50.8	+2.88096
10	130	II. U.	22 23 57.41	2.11998	66.09	- 4 28 3.2	+2.88975
11	131	II. L.	22 50 7.08	2.11361	65.58	- 1 52 14.7	+2.89242
11	131	II. U.	23 15 57.39	2.10917	65.21	+ 0 43 30.8	+2.88954
12	132	II. L.	23 41 35.29	2.10663	64.98	+ 3 17 17.7	+2.88131
12	133	II. U.	0 7 7.44	2.10592	64.90	+ 5 47 16.0	+2.86768
13	133	II. L.	0 32 39.76	2.10670	64.92	+ 8 11 40.9	+2.84845
13	134	II. U.	0 58 17.44	2.10887	65.05	+10 28 52.8	+2.82295
14	134	II. L.	1 24 4.67	2.11203	65.27	+12 37 15.8	+2.79053
14	135	II. U.	1 50 4.46	2.11584	65.54	+14 35 18.5	+2.74970
15	135	II. L.	2 16 18.55	2.11989	65.84	+16 21 36.0	+2.69880
15	136	II. U.	2 42 47.33	2.12378	66.13	+17 54 49.9	+2.63501
16	136	II. L.	3 9 29.63	2.12717	66.39	+19 13 51.3	+2.55378
16	137	I. U.	3 34 9.79	2.12969	66.58	+20 17 43.6	+2.44730
17	137	I. L.	4 1 10.18	2.13108	66.70	+21 5 42.7	+2.29962
18	138	I. U.	4 28 13.33	2.13108	66.71	+21 37 20.3	+2.06774
18	138	I. L.	4 55 13.97	2.12963	66.61	+21 52 24.8	+1.53173
19	139	I. U.	5 22 6.59	2.12665	66.41	+21 51 0.5	-1.67934
19	139	I. L.	5 48 45.98	2.12235	66.12	+21 33 27.6	-2.10476
20	140	I. U.	6 15 7.69	2.11691	65.71	+21 0 19.8	-2.30850
20	140	I. L.	6 41 8.17	2.11056	65.25	+20 12 22.2	-2.44002
21	141	I. U.	7 6 45.10	2.10373	64.75	+19 10 28.2	-2.53490
21	141	I. L.	7 31 57.59	2.09670	64.24	+17 55 37.0	-2.60737
22	142	I. U.	7 56 46.02	2.08967	63.76	+16 28 51.2	-2.66447
22	142	I. L.	8 21 12.04	2.08354	63.32	+14 51 14.7	-2.71048
23	143	I. U.	8 45 18.49	2.07898	62.94	+13 3 50.8	-2.74797
23	143	I. L.	9 9 9.17	2.07427	62.65	+11 7 42.5	-2.77872
24	144	I. U.	9 32 48.74	2.07173	62.48	+ 9 3 52.1	-2.80397
24	144	I. L.	9 56 22.67	2.07100	62.43	+ 6 53 21.2	-2.82448
25	145	I. U.	10 19 57.02	2.07218	62.52	+ 4 37 12.5	-2.84066
25	145	I. L.	10 43 38.43	2.07555	62.75	+ 2 16 33.7	-2.85292
26	146	I. U.	11 7 34.01	2.08103	63.13	- 0 7 27.2	-2.86126
26	146	I. L.	11 31 51.17	2.08867	63.70	- 2 33 31.7	-2.86519
27	147	I. U.	11 56 37.70	2.09850	64.43	- 5 0 12.7	-2.86468
27	148	I. L.	12 22 1.45	2.11025	65.30	- 7 25 50.4	-2.85879
28	148	I. U.	12 48 10.10	2.12378	66.32	- 9 48 30.4	-2.84656
28	149	I. L.	13 15 10.79	2.13865	67.48	-12 6 0.8	-2.82646
29	149	I. U.	13 43 9.71	2.15439	68.72	-14 15 51.4	-2.79613
29	150	I. L.	14 12 11.34	2.17035	70.02	-16 15 15.2	-2.75277
30	150	I. U.	14 42 17.57	2.18583	71.31	-18 1 13.3	-2.69122
30	151	I. L.	15 13 27.06	2.19998	72.50	-19 30 40.0	-2.60321
31	151	I. U.	15 45 34.30	2.21197	73.54	-20 40 35.2	-2.47191
31	152	I. L.	16 18 29.40	2.22099	74.34	-21 28 18.7	-2.25384
June 1	152	II. U.	16 54 28.23	2.22642	74.83	-21 51 46.1	-1.73230
2	153	II. L.	17 28 14.44	2.22814	74.97	-21 49 43.2	+1.87390
2	153	II. U.	18 1 58.26	2.22541	74.79	-21 21 54.5	+2.30654
3	154	II. L.	18 35 21.84	2.21924	74.29	-20 29 7.3	+2.51035
3	154	II. U.	19 8 9.81	2.20904	73.48	-19 13 4.8	+2.63790
4	155	II. L.	19 40 10.73	2.19835	72.48	-17 36 14.3	+2.72544
4	155	II. U.	20 11 17.61	2.18534	71.39	-15 41 32.6	+2.78729

MOON CULMINATIONS, 1863. 311

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
June 5	156	II. L.	^h 20 ^m 41 ^s 27.64	2.17167	70.26	—13° 32' 10.9"	+2.83123
5	156	II. U.	21 10 41.78	2.15812	69.17	—11 11 22.3	+2.86181
6	157	II. L.	21 39 3.73	2.14551	68.15	— 8 42 10.8	+2.88197
6	157	II. U.	22 6 30.18	2.13421	67.25	— 6 7 28.7	+2.89365
7	158	II. L.	22 33 35.14	2.12460	66.50	— 3 29 52.6	+2.89841
7	158	II. U.	22 59 59.11	2.11691	65.89	— 0 51 42.9	+2.89688
8	159	II. L.	23 25 58.89	2.11123	65.45	+ 1 44 54.4	+2.88986
8	159	II. U.	23 51 41.92	2.10752	65.15	+ 4 18 5.8	+2.87758
9	160	II. L.	0 17 15.33	2.10571	64.99	+ 6 46 8.1	+2.86012
9	161	II. U.	0 42 45.56	2.10568	64.96	+ 9 7 26.5	+2.83709
10	161	II. L.	1 8 18.19	2.10704	65.05	+11 20 32.6	+2.80799
10	162	II. U.	1 33 57.87	2.10958	65.22	+13 24 3.6	+2.77189
11	162	II. L.	1 50 43.06	2.11201	65.45	+15 16 41.4	+2.72743
11	163	II. U.	2 25 50.96	2.11661	65.70	+16 57 13.1	+2.67253
12	163	II. L.	2 52 7.42	2.12034	65.96	+18 24 32.0	+2.60397
12	164	II. U.	3 18 36.81	2.12365	66.19	+19 37 38.4	+2.51667
13	164	II. L.	3 45 17.11	2.12623	66.37	+20 35 42.6	+2.40047
13	165	II. U.	4 12 5.04	2.12772	66.47	+21 18 5.4	+2.23536
14	165	II. L.	4 38 56.23	2.12798	66.47	+21 44 21.6	+1.95751
14	166	II. U.	5 5 45.66	2.12678	66.37	+21 54 20.2	+0.95909
15	166	I. L.	5 30 15.64	2.12415	66.16	+21 48 5.9	—1.85345
16	167	I. U.	5 56 46.29	2.12008	65.85	+21 25 58.2	—2.17479
16	167	I. L.	6 23 0.26	2.11484	65.45	+20 48 30.3	—2.35100
17	168	I. U.	6 48 53.51	2.10867	64.99	+19 56 27.6	—2.47016
17	168	I. L.	7 14 23.75	2.10189	64.48	+18 50 45.0	—2.55756
18	169	I. U.	7 39 29.51	2.09475	63.97	+17 32 24.0	—2.62493
18	169	I. L.	8 4 10.84	2.08768	63.46	+16 2 30.7	—2.67791
19	170	I. U.	8 28 28.89	2.08106	62.99	+14 22 13.1	—2.72069
19	170	I. L.	8 52 26.08	2.07529	62.59	+12 32 40.0	—2.75510
20	171	I. U.	9 16 5.82	2.07063	62.27	+10 34 59.6	—2.78304
20	171	I. L.	9 39 32.46	2.06740	62.06	+ 8 30 18.8	—2.80557
21	172	I. U.	10 2 51.09	2.06592	61.97	+ 6 19 43.6	—2.82236
21	172	I. L.	10 26 7.47	2.06618	62.01	+ 4 4 19.8	—2.83701
22	173	I. U.	10 49 28.02	2.06360	62.21	+ 1 45 14.2	—2.84685
22	173	I. L.	11 12 59.54	2.07324	62.59	— 0 36 24.1	—2.85279
23	174	I. U.	11 36 49.40	2.08001	63.08	— 2 59 21.5	—2.85483
23	175	I. L.	12 1 5.16	2.08895	63.75	— 5 22 17.6	—2.85252
24	175	I. U.	12 25 54.71	2.10010	64.59	— 7 43 42.7	—2.84546
24	176	I. L.	12 51 25.91	2.11304	65.57	—10 1 55.8	—2.83250
25	176	I. U.	13 17 46.37	2.12762	66.70	—12 14 59.2	—2.81217
25	177	I. L.	13 45 3.05	2.14339	67.94	—14 20 42.6	—2.78260
26	177	I. U.	14 13 21.60	2.15978	69.27	—16 16 36.8	—2.74079
26	178	I. L.	14 42 45.79	2.17603	70.60	—17 59 57.9	—2.68179
27	178	I. U.	15 13 16.43	2.19165	71.90	—19 27 52.2	—2.59768
27	179	I. L.	15 44 50.76	2.20556	73.08	—20 37 23.0	—2.47232
28	179	I. U.	16 17 21.70	2.21693	74.06	—21 25 43.5	—2.26621
28	180	I. L.	16 50 37.75	2.22505	74.76	—21 50 32.5	—1.79414
29	180	I. U.	17 24 23.54	2.22946	75.14	—21 50 7.5	+1.82471
29	181	I. L.	17 58 21.14	2.22078	75.16	—21 23 43.8	+2.29445
30	181	II. U.	18 34 41.68	2.22629	74.84	—20 31 37.2	+2.50939

312 MOON CULMINATIONS, 1863.

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
July 1	182	II. L.	^h 19 ^m 8 ^s 7.37	2.21921	74.26	—19 15' 8.0	+2.64405
1	182	II. U.	19 40 54.45	2.20065	73.38	—17 36 27.1	+2.73566
2	183	II. L.	20 12 53.18	2.19780	72.37	—15 38 33.4	+2.80078
2	183	II. U.	20 43 58.10	2.18498	71.29	—13 24 47.9	+2.84674
3	184	II. L.	21 14 7 88	2.17188	70.21	—10 58 41.7	+2.87819
3	184	II. U.	21 43 24.45	2.15921	69.19	— 8 23 45.0	+2.89626
4	185	II. L.	22 11 52.23	2.14753	68.25	— 5 43 15.4	+2.90915
4	185	II. U.	22 39 37.29	2.13723	67.45	— 3 0 14.1	+2.91211
5	186	II. L.	23 6 46 59	2.12859	66.80	— 0 17 23.1	+2.90835
5	186	II. U.	23 33 27.46	2.12199	66.28	+ 2 22 55.2	+2.89653
6	187	II. L.	23 59 47.19	2.11724	65.89	+ 4 58 36.4	+2.88225
6	188	II. U.	0 25 52.80	2.11414	65.69	+ 7 27 50.6	+2.86175
7	188	II. L.	0 51 50.49	2.11271	65.59	+ 9 49 2.0	+2.83466
7	189	II. U.	1 17 46.81	2.11284	65.56	+12 0 45.3	+2.80128
8	189	II. L.	1 43 43.43	2.11397	65.66	+14 1 43.9	+2.76043
8	190	II. U.	2 9 46.75	2.11581	65.80	+15 50 49.3	+2.71094
9	190	II. L.	2 35 58.07	2.11829	65.96	+17 27 0.0	+2.65033
9	191	II. U.	3 2 18.41	2.12083	66.13	+18 49 20.9	+2.57495
10	191	II. L.	3 28 47.49	2.12304	66.28	+19 57 5.7	+2.47870
10	192	II. U.	3 55 23.80	2.12470	66.38	+20 49 36.2	+2.34904
11	192	II. L.	4 22 4.61	2.12545	66.41	+21 26 24.0	+2.15863
11	193	II. U.	4 48 46.36	2.12513	66.35	+21 47 12.3	+1.80516
12	193	II. L.	5 15 24.83	2.12365	66.20	+21 51 56.8	—1.21112
12	194	II. U.	5 41 55.54	2.12097	65.97	+21 40 46.1	—1.97873
13	194	II. L.	6 8 14.01	2.11791	65.64	+21 14 1.2	—2.23497
13	195	II. U.	6 34 16.31	2.11196	65.23	+20 32 15.9	—2.38924
14	195	II. L.	6 59 59.23	2.10619	64.77	+19 36 14.9	—2.49729
14	196	II. U.	7 25 20.50	2.09979	64.30	+18 26 51.5	—2.57795
15	196	I. L.	7 48 11.38	2.09311	63.76	+17 5 6.9	—2.64084
16	197	I. U.	8 12 47.95	2.08647	63.26	+15 32 6.5	—2.69114
16	197	I. L.	8 37 2.63	2.08023	62.81	+13 48 59.8	—2.73146
17	198	I. U.	9 0 57.52	2.07471	62.41	+11 56 58.0	—2.76382
17	198	I. L.	9 24 35.62	2.07015	62.09	+ 9 57 12.6	—2.78968
18	199	I. U.	9 48 0.71	2.06689	61.88	+ 7 50 55.3	—2.81011
18	199	I. L.	10 11 17.38	2.06510	61.77	+ 5 39 17.7	—2.82571
19	200	I. U.	10 34 30.80	2.06506	61.79	+ 3 23 31.2	—2.83705
19	200	I. L.	10 57 46.71	2.06685	61.95	+ 1 4 48.0	—2.84444
20	201	I. U.	11 21 11.29	2.07063	62.25	— 1 15 38.7	—2.84783
20	201	I. L.	11 44 51.14	2.07642	62.70	— 3 36 31.9	—2.84714
21	202	I. U.	12 8 53.15	2.08426	63.31	— 5 56 30.8	—2.84213
21	203	I. L.	12 33 24.47	2.09402	64.07	— 8 14 7.8	—2.83224
22	203	I. U.	12 58 32.25	2.10548	64.96	—10 27 46.8	—2.81652
22	204	I. L.	13 24 23.42	2.11873	66.00	—12 35 41.5	—2.79383
23	204	I. U.	13 51 4.45	2.13309	67.13	—14 35 54.6	—2.76236
23	205	I. L.	14 18 40.79	2.14814	68.35	—16 26 15.3	—2.71865
24	205	I. U.	14 47 16.41	2.16352	69.61	—18 4 22.2	—2.65863
24	206	I. L.	15 16 53.09	2.17837	70.84	—19 27 44.5	—2.57495
25	206	I. U.	15 47 29.71	2.19209	71.99	—20 33 48.0	—2.45150
25	207	I. L.	16 19 1.73	2.20388	72.99	—21 20 3.7	—2.25052
26	207	I. U.	16 51 20.91	2.21315	73.78	—21 44 19.3	—1.80010

MOON CULMINATIONS, 1863. 313

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		^{h m s}		^s	^{° ' "}	
July 26	208	I. L.	17 24 15.48	2.21929	74.30	-21 44 51.0	+1.77012
27	208	I. U.	17 57 31.01	2.22204	74.51	-21 20 37.0	+2.26423
27	209	I. L.	18 30 51.64	2.22128	74.42	-20 31 26.8	+2.48734
28	209	I. U.	19 4 1.90	2.21743	74.04	-19 18 5.7	+2.62816
28	210	I. L.	19 36 48.07	2.21059	73.43	-17 42 13.3	+2.72582
29	210	I. U.	20 8 59.39	2.20178	72.65	-15 46 15.8	+2.79598
30	211	II. L.	20 42 52.31	2.19153	71.77	-13 33 14.8	+2.84640
30	211	II. U.	21 13 34.34	2.18064	70.84	-11 6 33.4	+2.88178
31	212	II. L.	21 43 30.70	2.16982	69.94	-8 29 44.0	+2.90501
31	212	II. U.	22 12 43.73	2.15951	69.11	-5 46 17.3	+2.91807
Aug. 1	213	II. L.	22 41 17.67	2.15023	68.38	-2 59 33.2	+2.92252
1	213	II. U.	23 9 17.90	2.14230	67.75	-0 12 36.7	+2.91934
2	214	II. L.	23 36 50.26	2.13580	67.26	+2 31 45.7	+2.90917
2	215	II. U.	0 4 1.05	2.13082	66.88	+5 11 7.9	+2.89252
3	215	II. L.	0 30 56.12	2.12730	66.64	+7 43 22.5	+2.86937
3	216	II. U.	0 57 40.85	2.12529	66.49	+10 6 39.1	+2.83966
4	216	II. L.	1 24 19.99	2.12431	66.44	+12 19 23.3	+2.80279
4	217	II. U.	1 50 57.33	2.12424	66.45	+14 29 15.1	+2.75781
5	217	II. L.	2 17 35.65	2.12483	66.50	+16 8 6.5	+2.70337
5	218	II. U.	2 44 16.68	2.12568	66.57	+17 42 0.9	+2.63688
6	218	II. L.	3 11 1.00	2.12652	66.64	+19 1 12.1	+2.55399
6	219	II. U.	3 37 48.13	2.12710	66.67	+20 5 4.0	+2.44734
7	219	II. L.	4 4 36.58	2.12720	66.68	+20 53 10.8	+2.30231
7	220	II. U.	4 31 23.90	2.12652	66.60	+21 25 16.8	+2.08038
8	220	II. L.	4 58 7.04	2.12496	66.45	+21 41 17.7	+1.60163
8	221	II. U.	5 24 42.59	2.12241	66.21	+21 41 19.0	-1.59682
9	221	II. L.	5 51 7.08	2.11893	65.90	+21 25 37.8	-2.06838
9	222	II. U.	6 17 17.25	2.11454	65.53	+20 54 41.6	-2.28305
10	222	II. L.	6 43 10.31	2.10938	65.10	+20 9 6.9	-2.42040
10	223	II. U.	7 8 44.06	2.10370	64.63	+19 9 38.8	-2.51940
11	223	II. L.	7 33 57.22	2.09767	64.14	+17 57 9.8	-2.59480
11	224	II. U.	7 58 49.36	2.09164	63.65	+16 32 38.2	-2.65423
12	224	II. L.	8 23 21.02	2.08572	63.18	+14 57 7.4	-2.70179
12	225	II. U.	8 47 33.63	2.08034	62.76	+13 11 44.2	-2.74010
13	225	II. L.	9 11 29.35	2.07566	62.40	+11 17 38.1	-2.77109
14	226	I. U.	9 33 7.01	2.07192	62.12	+9 16 0.9	-2.79581
14	226	I. L.	9 56 39.07	2.06945	61.94	+7 8 6.1	-2.81509
15	227	I. U.	10 20 4.99	2.06826	61.85	+4 55 8.4	-2.82952
15	227	I. L.	10 43 29.39	2.06867	61.89	+2 38 24.4	-2.83947
16	228	I. U.	11 6 57.47	2.07071	62.06	+0 19 12.5	-2.84501
16	228	I. L.	11 30 34.66	2.07445	62.36	-2 1 6.3	-2.84633
17	229	I. U.	11 54 26.74	2.07994	62.80	-4 21 7.6	-2.84322
17	230	I. L.	12 18 39.69	2.08718	63.37	-6 39 23.4	-2.83530
18	230	I. U.	12 43 19.52	2.09597	64.06	-8 54 20.8	-2.82206
18	231	I. L.	13 8 32.17	2.10633	64.88	-11 4 20.1	-2.80257
19	231	I. U.	13 34 23.28	2.11783	65.80	-13 7 35.5	-2.77554
19	232	I. L.	14 0 57.86	2.13030	66.81	-15 2 14.4	-2.73905
20	232	I. U.	14 28 20.08	2.14333	67.88	-16 46 16.5	-2.69022
20	233	I. L.	14 56 32.55	2.15640	68.96	-18 17 33.9	-2.62438
21	233	I. U.	15 25 36.07	2.16897	70.01	-19 33 59.1	-2.53310

314 MOON CULMINATIONS, 1863.

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	d		^h ^m ^s		^s	[°] ['] ["]	
Aug. 21	234	I. L.	15 55 29.24	2.18061	70.99	-20 33' 23.5	-2.39974
22	234	I. U.	16 26 8.03	2.19058	71.83	-21 13 47.3	-2.18016
22	235	I. L.	16 57 25.60	2.19849	72.54	-21 33 25.1	-1.64008
23	235	I. U.	17 29 12.90	2.20336	72.97	-21 30 55.8	+1.84080
23	236	I. L.	18 1 18.77	2.20670	73.18	-21 5 30.4	+2.26696
24	236	I. U.	18 33 31.27	2.20675	73.17	-20 16 58.9	+2.47665
24	237	I. L.	19 5 38.74	2.20423	72.92	-19 5 53.6	+2.61297
25	237	I. U.	19 37 30.57	2.19959	72.48	-17 33 30.2	+2.70958
25	238	I. L.	20 8 58.26	2.19323	71.90	-15 41 42.6	+2.78074
26	238	I. U.	20 39 56.06	2.18569	71.23	-13 32 57.7	+2.83346
26	239	I. L.	21 10 21.06	2.17765	70.53	-11 10 7.8	+2.87172
27	239	I. U.	21 40 12.16	2.16955	69.83	-8 36 20.7	+2.89814
27	240	II. L.	22 11 49.28	2.16194	69.20	-5 54 51.1	+2.91434
28	240	II. U.	22 40 37.46	2.15506	68.62	-3 8 54.3	+2.92197
29	241	II. L.	23 9 0.48	2.14928	68.14	-0 21 39.3	+2.92144
29	241	II. U.	23 37 2.90	2.14460	67.78	+2 23 55.7	+2.91336
30	242	II. L.	0 4 49.42	2.14095	67.52	+5 5 7.2	+2.89804
30	243	II. U.	0 32 24.52	2.13852	67.35	+7 39 27.4	+2.87511
31	243	II. L.	0 59 52.22	2.13710	67.26	+10 4 46.2	+2.84559
31	244	II. U.	1 27 15.85	2.13631	67.23	+12 19 11.6	+2.80769
Sept. 1	244	II. L.	1 54 37.72	2.13606	67.24	+14 21 8.4	+2.76052
1	245	II. U.	2 21 59.32	2.13612	67.28	+16 9 17.9	+2.70298
2	245	II. L.	2 49 21.12	2.13615	67.30	+17 42 38.8	+2.63176
2	246	II. U.	3 16 42.46	2.13580	67.30	+19 0 24.4	+2.54250
3	246	II. L.	3 44 1.80	2.13503	67.26	+20 2 2.1	+2.42690
3	247	II. U.	4 11 16.89	2.13357	67.16	+20 47 13.8	+2.26642
4	247	II. L.	4 38 24.83	2.13121	66.98	+21 15 54.3	+2.00967
4	248	II. U.	5 5 22.53	2.12805	66.73	+21 28 10.4	+1.31660
5	248	II. L.	5 32 6.81	2.12402	66.40	+21 24 20.2	-1.76908
5	249	II. U.	5 58 34.78	2.11919	66.00	+21 4 51.6	-2.13181
6	249	II. L.	6 24 44.10	2.11388	65.55	+20 30 20.9	-2.32000
6	250	II. U.	6 50 33.07	2.10792	65.07	+19 41 31.5	-2.44491
7	250	II. L.	7 16 0.71	2.10175	64.58	+18 39 12.7	-2.53639
7	251	II. U.	7 41 6.85	2.09566	64.07	+17 24 18.0	-2.60693
8	251	II. L.	8 5 52.38	2.08984	63.59	+15 57 45.1	-2.66284
8	252	II. U.	8 30 18.80	2.08451	63.17	+14 20 34.2	-2.70820
9	252	II. L.	8 54 28.36	2.07983	62.78	+12 33 48.3	-2.74504
9	253	II. U.	9 18 24.00	2.07613	62.46	+10 38 33.0	-2.77496
10	253	II. L.	9 42 9.40	2.07361	62.24	+8 35 55.8	-2.79903
10	254	II. U.	10 5 48.46	2.07229	62.12	+6 27 7.0	-2.81784
11	254	II. L.	10 28 25.59	2.07240	62.11	+4 13 20.9	-2.83195
11	255	II. U.	10 53 5.60	2.07404	62.21	+1 55 55.2	-2.84142
12	255	I. L.	11 14 48.68	2.07726	62.44	-0 23 48.7	-2.84641
13	256	I. U.	11 38 49.09	2.08200	62.79	-2 44 24.3	-2.84667
13	257	I. L.	12 3 7.63	2.08828	63.27	-5 4 19.1	-2.84211
14	257	I. U.	12 27 49.62	2.09601	63.86	-7 21 55.9	-2.83216
14	258	I. L.	12 53 0.20	2.10600	64.56	-9 35 31.1	-2.81616
15	258	I. U.	13 18 44.16	2.11501	65.37	-11 43 15.0	-2.79300
15	259	I. L.	13 45 5.66	2.12584	66.24	-13 43 13.1	-2.76131
16	259	I. U.	14 12 7.96	2.13710	67.17	-15 33 25.8	-2.71876

MOON CULMINATIONS, 1863. 315

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		^{h m s}		^s		
Sept. 16	260	I. L.	14 30 53.17	2.14838	68.11	-17° 11' 51.2"	-2.66202
17	260	I. U.	15 8 21.73	2.15030	69.04	-18 36 27.5	-2.58558
17	261	I. L.	15 37 32.39	2.16038	69.90	-19 45 16.6	-2.47928
18	261	I. U.	16 7 21.72	2.17811	70.66	-20 36 29.5	-2.32098
18	262	I. L.	16 37 44.23	2.18512	71.28	-21 8 31.2	-2.04179
19	262	I. U.	17 8 32.48	2.19011	71.72	-21 20 7.1	-0.72428
19	263	I. L.	17 39 37.69	2.19282	71.95	-21 10 28.6	+2.00906
20	263	I. U.	18 10 50.20	2.19337	72.01	-20 39 17.0	+2.32162
20	264	I. L.	18 42 0.57	2.19167	71.86	-19 46 45.7	+2.49811
21	264	I. U.	19 13 0.19	2.18820	71.55	-18 33 41.1	+2.61781
21	265	I. L.	19 43 41.94	2.18333	71.10	-17 1 20.1	+2.70526
22	265	I. U.	20 14 00.68	2.17728	70.57	-15 11 27.1	+2.77091
22	266	I. L.	20 43 53.55	2.17082	69.99	-13 6 9.0	+2.82047
23	266	I. U.	21 13 19.70	2.16429	69.41	-10 47 50.1	+2.85717
23	267	I. L.	21 42 20.06	2.15818	68.88	-8 19 7.6	+2.88359
24	267	I. U.	22 10 57.13	2.15271	68.40	-5 42 47.0	+2.90097
24	268	I. L.	22 39 14.39	2.14817	68.00	-3 1 37.3	+2.91015
25	268	I. U.	23 7 15.91	2.14476	67.70	-0 18 28.4	+2.91168
25	269	I. L.	23 35 6.18	2.14248	67.50	+2 23 53.4	+2.90598
26	270	II. U.	0 5 4.24	2.14117	67.40	+5 2 47.9	+2.89301
27	270	II. L.	0 32 44.33	2.14088	67.37	+7 35 44.0	+2.87259
27	271	II. U.	1 0 24.71	2.14133	67.42	+10 0 21.8	+2.84436
28	271	II. L.	1 28 7.63	2.14214	67.50	+12 14 34.9	+2.80744
28	272	II. U.	1 55 54.33	2.14323	67.61	+14 16 32.4	+2.76070
29	272	II. L.	2 23 44.89	2.14414	67.72	+16 4 41.0	+2.70237
29	273	II. U.	2 51 38.23	2.14457	67.79	+17 37 45.1	+2.62923
30	273	II. L.	3 19 32.18	2.14438	67.80	+18 54 46.5	+2.53642
30	274	II. U.	3 47 23.58	2.14317	67.75	+19 55 7.2	+2.41409
Oct. 1	274	II. L.	4 15 8.67	2.14104	67.61	+20 38 28.7	+2.24095
1	275	II. U.	4 42 43.40	2.13783	67.38	+21 4 48.5	+1.95100
2	275	II. L.	5 10 3.62	2.13344	67.06	+21 14 19.3	+0.79309
2	276	II. U.	5 37 5.48	2.12808	66.65	+21 7 28.0	-1.87058
3	276	II. L.	6 3 45.92	2.12192	66.18	+20 44 52.4	-2.17915
3	277	II. U.	6 30 2.61	2.11514	65.66	+20 7 19.0	-2.34980
4	277	II. L.	6 55 54.29	2.10806	65.11	+19 15 40.2	-2.46517
4	278	II. U.	7 21 21.71	2.10096	64.56	+18 10 52.9	-2.55046
5	278	II. L.	7 46 22.65	2.09409	64.01	+16 53 55.6	-2.61649
5	279	II. U.	8 11 1.89	2.08775	63.52	+15 25 48.3	-2.66915
6	279	II. L.	8 35 20.98	2.08221	63.08	+13 47 31.7	-2.71189
6	280	II. U.	8 59 23.27	2.07773	62.71	+12 0	-2.74685
7	280	II. L.	9 23 12.71	2.07449	62.43	+10	
7	281	II. U.	9 46 53.75	2.07266	62.26	+8	
8	281	II. L.	10 10 31.28	2.07232	62.20	+5	
8	282	II. U.	10 34 10.51	2.07368	62.26	+	
9	282	II. L.	10 57 56.86	2.07668	62.46	+	
9	283	II. U.	11 21 55.97	2.08142	62.77		
10	283	II. L.	11 46 13.54	2.08775	63.22		-2.84601
10	284	II. U.	12 10 55.17	2.09563	63.79		-2.84131
11	285	II. L.	12 36 6.26	2.10483	64.47		-2.83075
11	285	I. U.	12 59 41.35	2.11514	65.27	-10 7 7.3	-2.81342

316 MOON CULMINATIONS, 1863.

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Lib and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		^{h m s}		^s	^{° ' "}	
Oct. 12	286	I. L.	13 26 4.00	2.12630	66.13	—12 13' 53.2	—2.78819
13	286	I. U.	13 53 8.71	2.13789	67.04	—14 12 14.3	—2.75360
13	287	I. L.	14 20 57.42	2.14947	68.01	—15 59 57.4	—2.70608
14	287	I. U.	14 49 30.58	2.16359	68.95	—17 34 47.8	—2.64170
14	288	I. L.	15 18 46.51	2.17085	69.82	—18 54 35.2	—2.55362
15	288	I. U.	15 48 41.19	2.17943	70.58	—19 57 17.5	—2.42788
15	289	I. L.	16 19 8.48	2.18611	71.18	—20 41 11.4	—2.23093
16	289	I. U.	16 50 0.11	2.19064	71.61	—21 4 54.7	—1.82302
16	290	I. L.	17 21 6.40	2.19277	71.82	—21 7 34.7	+1.60293
17	290	I. U.	17 52 16.93	2.19243	71.82	—20 48 51.8	+2.16682
17	291	I. L.	18 23 21.54	2.18983	71.61	—20 8 59.2	+2.40002
18	291	I. U.	18 54 10.95	2.18523	71.26	—19 8 42.5	+2.54464
18	292	I. L.	19 24 37.98	2.17904	70.75	—17 49 17.1	+2.64570
19	292	I. U.	19 54 37.41	2.17202	70.19	—16 12 21.9	+2.72026
19	293	I. L.	20 24 6.71	2.16447	69.52	—14 19 53.2	+2.77651
20	293	I. U.	20 53 5.29	2.15694	68.88	—12 14 0.3	+2.81893
20	294	I. L.	21 21 34.73	2.14986	68.29	—9 57 0.3	+2.85050
21	294	I. U.	21 49 38.13	2.14373	67.76	—7 31 16.5	+2.87303
21	295	I. L.	22 17 19.77	2.13874	67.31	—4 59 12.0	+2.88770
22	295	I. U.	22 44 44.60	2.13507	66.98	—2 23 11.9	+2.89528
22	296	I. L.	23 11 58.02	2.13277	66.78	+0 14 19.4	+2.89621
23	296	I. U.	23 39 5.38	2.13191	66.68	+2 50 58.8	+2.89054
23	297	I. L.	0 6 11.75	2.13232	66.68	+5 24 27.0	+2.87827
24	298	I. U.	0 33 21.55	2.13383	66.77	+7 52 27.5	+2.85892
24	298	I. L.	1 0 38.40	2.13615	66.93	+10 12 49.4	+2.83202
25	299	I. U.	1 28 4.85	2.13890	67.14	+12 23 29.3	+2.79651
25	299	II. L.	1 57 56.88	2.14176	67.37	+14 22 34.5	+2.75093
26	300	II. U.	2 25 45.27	2.14442	67.58	+16 8 23.4	+2.69306
27	300	II. L.	2 53 42.64	2.14635	67.77	+17 39 30.3	+2.61968
27	301	II. U.	3 21 45.91	2.14737	67.87	+18 54 47.1	+2.52550
28	301	II. L.	3 49 50.85	2.14718	67.88	+19 53 24.7	+2.39872
28	302	II. U.	4 17 52.32	2.14557	67.78	+20 34 55.0	+2.21577
29	302	II. L.	4 45 44.74	2.14251	67.56	+20 59 9.7	+1.89409
29	303	II. U.	5 13 22.63	2.13802	67.24	+21 6 19.9	—0.78888
30	303	II. L.	5 40 40.83	2.13220	66.82	+20 56 54.4	—1.94191
30	304	II. U.	6 7 35.14	2.12529	66.30	+20 31 35.1	—2.21717
31	304	II. L.	6 34 2.49	2.11760	65.73	+19 51 15.7	—2.37570
31	305	II. U.	7 0 1.14	2.10948	65.12	+18 56 56.4	—2.48401
Nov. 1	305	II. L.	7 25 30.66	2.10123	64.52	+17 49 41.9	—2.56418
1	306	II. U.	7 50 31.85	2.09332	63.94	+16 30 38.8	—2.62623
2	306	II. L.	8 15 6.76	2.08600	63.40	+15 0 53.1	—2.67549
2	307	II. U.	8 39 18.42	2.07958	62.92	+13 21 29.6	—2.71545
3	307	II. L.	9 3 10.74	2.07438	62.52	+11 33 31.0	—2.74779
3	308	II. U.	9 26 48.36	2.07063	62.23	+9 37 58.2	—2.77451
4	308	II. L.	9 50 16.51	2.06968	62.06	+7 35 51.7	—2.79606
4	309	II. U.	10 13 40.83	2.06834	62.02	+5 28 11.9	—2.81395
5	309	II. L.	10 37 7.36	2.06997	62.12	+3 16 1.1	—2.89634
5	310	II. U.	11 0 42.41	2.07354	62.35	+1 0 24.2	—2.83552
6	310	II. L.	11 24 32.50	2.07914	62.73	—1 17 27.5	—2.84062
6	311	II. U.	11 48 44.26	2.08661	63.25	—3 36 16.2	—2.84139

MOON CULMINATIONS, 1863. 317

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.	
Nov.	7	312 ^d	II. L.	12 13 24.37	2.09587	63.91	— 5 54 34.5	—2.83729
	7	312	II. U.	12 38 39.13	2.10670	64.71	— 8 10 43.3	—2.82758
	8	313	II. L.	13 4 34.47	2.11880	65.61	—10 22 51.9	—2.81115
	8	313	II. U.	13 31 15.62	2.13184	66.61	—12 28 56.8	—2.78644
	9	314	II. L.	13 58 46.60	2.14536	67.67	—14 26 42.5	—2.75125
	9	314	II. U.	14 27 9.72	2.15872	68.74	—16 13 43.8	—2.70249
	10	315	I. L.	14 54 5.52	2.17146	69.79	—17 47 30.7	—2.63511
	11	315	I. U.	15 24 8.63	2.18290	70.75	—19 5 34.2	—2.54083
	11	316	I. L.	15 54 56.30	2.19237	71.58	—20 5 35.9	—2.40078
	12	316	I. U.	16 26 19.94	2.19935	72.20	—20 45 37.5	—2.16856
	12	317	I. L.	16 58 8.60	2.20355	72.59	—21 4 9.6	—1.57031
	13	317	I. U.	17 30 9.52	2.20471	72.72	—21 0 22.0	+1.87720
	13	318	I. L.	18 2 9.36	2.20268	72.60	—20 34 5.2	+2.27161
	14	318	I. U.	18 33 55.34	2.19895	72.24	—19 45 54.5	+2.46807
	14	319	I. L.	19 5 16.44	2.19139	71.70	—18 37 3.3	+2.59459
	15	319	I. U.	19 36 4.57	2.18304	71.00	—17 9 17.5	+2.68362
	15	320	I. L.	20 6 14.48	2.17322	70.22	—15 24 46.2	+2.74859
	16	320	I. U.	20 35 44. 9	2.16325	69.41	—13 25 52.4	+2.79671
	16	321	I. L.	21 4 33.89	2.15366	68.62	—11 15 5.8	+2.83209
	17	321	I. U.	21 32 46.75	2.14483	67.90	— 8 54 57.1	+2.85735
	17	322	I. L.	22 0 27.14	2.13694	67.27	— 6 27 53.3	+2.87426
	18	322	I. U.	22 27 40.68	2.13069	66.75	— 3 56 16.5	+2.88400
	18	323	I. L.	22 54 33.60	2.12637	66.37	— 1 22 22.6	+2.88735
	19	323	I. U.	23 21 12.45	2.12304	66.12	+ 1 11 33.3	+2.88468
	19	324	I. L.	23 47 43.59	2.12202	66.00	+ 3 43 41.4	+2.87622
	20	325	I. U.	0 14 13.15	2.12254	66.00	+ 6 11 46.3	+2.86170
	20	325	I. L.	0 40 46.44	2.12418	66.11	+ 8 33 56.8	+2.84062
	21	326	I. U.	1 7 28.04	2.12688	66.29	+10 48 21.3	+2.81270
	21	326	I. L.	1 34 21.32	2.13046	66.53	+12 53 12.8	+2.77635
	22	327	I. U.	2 1 28.33	2.13428	66.81	+14 46 50.4	+2.73021
	22	327	I. L.	2 28 49.70	2.13799	67.08	+16 27 41.0	+2.67187
	23	328	I. U.	2 56 24.42	2.14120	67.33	+17 54 21.8	+2.59763
23	328	I. L.	3 24 9.82	2.14349	67.51	+19 5 44.2	+2.50109	
24	329	II. U.	3 54 17.04	2.14451	67.58	+20 0 55.1	+2.36981	
25	329	II. L.	4 22 10.38	2.14404	67.54	+20 39 19.3	+2.17458	
25	330	II. U.	4 49 58.87	2.14195	67.38	+21 0 42.3	+1.80916	
26	330	II. L.	5 17 36.26	2.13827	67.10	+21 5 8.5	—1.29292	
26	331	II. U.	5 44 56.59	2.13296	66.72	+20 53 1.8	—2.00415	
27	331	II. L.	6 11 54.62	2.12643	66.23	+20 25 1.9	—2.25115	
27	332	II. U.	6 38 26.24	2.11877	65.65	+19 42 2.4	—2.39913	
28	332	II. L.	7 4 28.72	2.11042	65.04	+18 45 5.8	—2.50185	
28	333	II. U.	7 30 0.73	2.10175	64.41	+17 35 22.2	—2.57822	
29	333	II. L.	7 55 2.58	2.09311	63.80	+16 14 2.7	—2.63707	
29	334	II. U.	8 19 35.59	2.08500	63.22	+14 42 19.6	—2.68349	
30	334	II. L.	8 43 42.62	2.07773	62.70	+13 1 24.6	—2.72068	
30	335	II. U.	9 7 27.40	2.07162	62.27	+11 12 25.8	—2.75067	
Dec.	1	335	II. L.	9 30 54.41	2.06689	61.84	+ 9 16 23.6	—2.77485
	1	336	II. U.	9 54 8.61	2.06386	61.73	+ 7 14 35.8	—2.79418
	2	336	II. L.	10 17 16.27	2.06269	61.66	+ 5 7 47.5	—2.80931
	2	337	II. U.	10 40 23.43	2.06356	61.71	+ 2 57 4.2	—2.82066

318 MOON CULMINATIONS, 1863.

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		^{h m s}		^s		
Dec. 3	337	II. L.	11 3 36.79	2.06655	61.93	+ 0 43' 27.2"	-2.82836
3	338	II. U.	11 27 3.29	2.07177	62.28	- 1 31 59.3	-2.83244
4	338	II. L.	11 50 50.17	2.07904	62.82	- 3 48 5.8	-2.83258
4	339	II. U.	12 15 4.66	2.08835	63.49	- 6 3 35.7	-2.83246
5	340	II. L.	12 39 54.10	2.09961	64.32	- 8 17 1.6	-2.81910
5	340	II. U.	13 5 25.55	2.11247	65.28	-10 26 44.8	-2.80356
6	341	II. L.	13 31 45.56	2.12662	66.35	-12 30 52.1	-2.79042
6	341	II. U.	13 58 59.65	2.14151	67.51	-14 27 16.1	-2.74730
7	342	II. L.	14 27 11.91	2.15638	68.72	-16 13 35.5	-2.70075
7	342	II. U.	14 56 24.22	2.17179	69.93	-17 47 17.4	-2.63607
8	343	II. L.	15 26 35.70	2.18563	71.06	-19 5 44.3	-2.54380
8	343	II. U.	15 57 42.08	2.19764	72.08	-20 6 20.9	-2.40550
9	344	II. L.	16 29 35.42	2.20713	72.89	-20 46 46.0	-2.17108
9	344	I. U.	16 59 37.40	2.21360	73.45	-21 5 6.2	-1.53339
10	345	I. L.	17 32 27.06	2.21653	73.70	-21 0 7.2	+1.92609
11	345	I. U.	18 5 22.93	2.21604	73.69	-20 31 22.9	+2.30677
11	346	I. L.	18 38 9.47	2.21224	73.38	-19 39 20.4	+2.50061
12	346	I. U.	19 10 32.62	2.20553	72.86	-18 25 16.5	+2.62554
12	347	I. L.	19 42 21.27	2.19656	72.08	-16 51 11.5	+2.71236
13	347	I. U.	20 13 27.82	2.18614	71.22	-14 59 38.2	+2.77584
13	348	I. L.	20 43 48.33	2.17496	70.31	-12 53 28.4	+2.82116
14	348	I. U.	21 13 22.36	2.16373	69.41	-10 35 39.5	+2.85313
14	349	I. L.	21 42 12.09	2.15305	68.55	- 8 9 11.8	+2.87457
15	349	I. U.	22 10 21.93	2.14361	67.80	- 5 36 55.6	+2.88728
15	350	I. L.	22 37 57.57	2.13558	67.18	- 3 1 29.6	+2.89263
16	350	I. U.	23 5 5.70	2.12921	66.67	- 0 25 20.6	+2.89139
16	351	I. L.	23 31 53.13	2.12467	66.31	+ 2 9 17.4	+2.88418
17	351	I. U.	23 58 26.83	2.12192	66.09	+ 4 40 22.5	+2.87122
17	352	I. L.	0 24 53.25	2.12080	65.99	+ 7 6 2.0	+2.85236
18	353	I. U.	0 51 18.34	2.12120	66.01	+ 9 24 32.1	+2.82734
18	353	I. L.	1 17 47.13	2.12284	66.11	+11 34 16.1	+2.79528
19	354	I. U.	1 44 23.55	2.12542	66.28	+13 33 43.5	+2.75528
19	354	I. L.	2 11 10.37	2.12846	66.50	+15 21 31.2	+2.70553
20	355	I. U.	2 38 8.97	2.13165	66.72	+16 56 22.7	+2.64340
20	355	I. L.	3 5 19.21	2.13456	66.92	+18 17 9.8	+2.56476
21	356	I. U.	3 32 39.43	2.13688	67.07	+19 22 55.6	+2.46224
21	356	I. L.	4 0 6.55	2.13811	67.14	+20 12 54.6	+2.32126
22	357	I. U.	4 27 36.38	2.13808	67.11	+20 46 36.6	+2.10476
22	357	I. L.	4 55 3.68	2.13666	66.97	+21 3 47.2	+1.64875
23	358	I. U.	5 22 22.86	2.13370	66.72	+21 4 29.2	-1.57194
23	358	I. L.	5 49 28.32	2.12927	66.36	+20 49 2.2	-2.06733
24	359	II. U.	6 18 26.67	2.12346	65.91	+20 18 1.7	-2.22490
25	359	II. L.	6 44 48.91	2.11654	65.38	+19 32 16.1	-2.42179
25	360	II. U.	7 10 44.63	2.10867	64.79	+18 32 45.5	-2.51861
26	360	II. L.	7 36 12.01	2.10065	64.18	+17 20 37.7	-2.59127
26	361	II. U.	8 1 10.52	2.09237	63.57	+15 57 4.5	-2.64758
27	361	II. L.	8 25 40.96	2.08422	62.99	+14 23 21.1	-2.69198
27	362	II. U.	8 49 45.36	2.07686	62.48	+12 40 41.6	-2.73719
28	362	II. L.	9 13 26.66	2.07037	62.03	+10 50 19.0	-2.75519
28	363	II. U.	9 36 48.78	2.06513	61.67	+ 8 53 24.4	-2.77740

MOON CULMINATIONS, 1863. 319

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascen- sion for 1 hour of Longitude.	Sidereal Time of Semi- diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		^h ^m ^s		^s	[°] ['] ^{''}	
Dec. 29	363	II. L.	9 59 56.37	2.06134	61.43	+ 6 51' 5.5	-2.79471
29	364	II. U.	10 22 54.68	2.05929	61.31	+ 4 44 27.0	-2.80765
30	364	II. L.	10 45 49.44	2.05918	61.33	+ 2 34 33.4	-2.81681
30	365	II. U.	11 8 46.94	2.06100	61.49	+ 0 22 27.6	-2.82235
31	365	II. L.	11 31 53.64	2.06498	61.80	- 1 50 47.2	-2.82425
31	366	II. U.	11 55 16.50	2.07100	62.26	- 4 4 3.0	-2.82250

320 MOON-CULMINATING STARS.

Sideral Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	35 Piscium.	d Piscium.	44 Piscium.	13 Ceti.	δ Piscium.	20 Ceti.	
	0° 7'	0° 13'	0° 18'	0° 28'	0° 41'	0° 46'	
23	56.14	33.86	23.59	12.47	35.46	1.35	— .010
51	55.94	33.64	23.36	12.22	35.22	1.08	— .005
134	56.77	34.43	24.11	12.88	35.79	1.60	+ .018
161	57.54	35.20	24.86	13.62	36.52	2.31	.030
188	58.40	36.04	25.69	14.46	37.36	3.14	.030
216	59.17	36.84	26.49	15.26	38.18	3.96	.025
243	59.71	37.38	27.04	15.85	38.79	4.57	.016
270	59.98	37.66	27.34	16.17	39.14	4.93	+ .007
298	59.98	37.69	27.37	16.22	39.25	5.04	— .002
325	59.80	37.52	27.21	16.08	39.10	4.94	.008
352	59.52	37.24	26.94	15.82	38.90	4.69	— .012
Dec. =	+ 8° 4'	+ 7° 26'	+ 1° 11'	— 4° 21'	+ 6° 50'	— 1° 53'	
Mag. =	6	6.5	6	6.5	4.5	5.6	
	ε Piscium.	ε Piscium.	ζ' Piscium.	40 Ceti.	μ Piscium.	γ Piscium.	
	0° 55'	1° 1'	1° 6'	1° 9'	1° 23'	1° 24'	
24	51.37	19.81	35.69	59.12	1.63	10.66	— .013
52	51.08	19.51	35.38	58.81	1.30	10.31	— .007
135	51.58	19.96	35.80	59.18	1.59	10.61	+ .021
162	52.29	20.66	36.50	59.86	2.26	11.30	.038
189	53.13	21.48	37.33	60.68	3.08	12.14	.030
216	53.93	22.28	38.14	61.49	3.89	12.98	.027
244	54.58	22.94	38.81	62.16	4.59	13.70	.020
271	54.96	23.34	39.22	62.57	5.04	14.16	.011
299	55.10	23.48	39.39	62.76	5.26	14.39	+ .002
326	55.02	23.42	39.34	62.69	5.25	14.38	— .004
353	54.80	23.20	39.13	62.47	5.06	14.20	— .009
Dec. =	+ 7° 9'	+ 4° 56'	+ 6° 51'	— 3° 0'	+ 5° 26'	+ 14° 38'	
Mag. =	4	6.5	5.4	6	5	4.3	
	π Piscium.	ν Piscium.	ο Piscium.	ε Arietis.	ξ' Ceti.	δ Arietis.	
	1° 29'	1° 34'	1° 38'	1° 49'	2° 5'	2° 10'	
25	51.54	19.42	10.97	53.72	45.86	32.23	— .017
53	51.19	19.07	10.62	53.33	45.48	31.82	— .009
136	51.46	19.29	10.82	53.46	45.47	31.79	+ .020
163	52.15	19.96	11.49	54.13	46.09	32.43	.027
190	52.98	20.77	12.31	54.97	46.88	33.26	.030
217	53.81	21.59	13.14	55.82	47.71	34.13	.028
245	54.52	22.30	13.86	56.58	48.46	34.92	.023
272	54.99	22.76	14.34	57.11	49.00	35.50	.015
299	55.21	22.99	14.58	57.40	49.32	35.86	+ .006
327	55.22	23.00	14.61	57.46	49.42	35.98	— .001
354	55.04	22.83	14.44	57.32	49.32	35.89	— .007
Dec. =	+ 11° 26'	+ 4° 48'	+ 8° 28'	+ 17° 9'	+ 8° 12'	+ 19° 16'	
Mag. =	6	5.4	4	6	4.5	6.5	
	ξ' Ceti.	38 Arietis.	π Arietis.	ρ' Arietis.	ο Arietis.	53 Arietis.	
	2° 20'	2° 37'	2° 41'	2° 48'	2° 51'	2° 59'	
26	54.16	31.56	40.74	43.82	24.76	44.77	— .017
53	53.78	31.16	40.33	43.41	24.34	44.35	.014
82	53.47	30.83	39.97	43.04	23.95	43.96	— .008
164	54.28	31.53	40.67	43.68	24.59	44.52	+ .024
191	55.05	32.29	41.45	44.46	25.38	45.28	.030
218	55.88	33.13	42.30	45.31	26.25	46.13	.030
246	56.66	33.93	43.12	46.15	27.10	46.97	.026
273	57.22	34.54	43.75	46.79	27.76	47.63	.020
300	57.57	34.94	44.18	47.24	28.22	48.10	.013
328	57.71	35.13	44.39	47.47	28.47	48.37	+ .004
355	57.62	35.09	44.35	47.46	28.46	48.37	— .005
Dec. =	+ 7° 51'	+ 11° 52'	+ 16° 54'	+ 17° 29'	+ 20° 47'	+ 17° 21'	
Mag. =	4	5	6.5	6	4.5	6	

MOON-CULMINATING STARS. 321

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	δ Arietis.	ζ Arietis.	τ^1 Arietis.	9 Tauri.	17 Tauri.	η Tauri.	
	$3^h 3^m$	$3^h 7^m$	$3^h 13^m$	$3^h 28^m$	$3^h 36^m$	$3^h 39^m$	
d	.	.	.	.	.	.
27	49.77	3.75	21.11	56.85	46.71	22.79	— .016
54	49.35	3.32	20.67	56.41	46.26	22.34	.015
83	48.95	2.91	20.25	55.96	45.80	21.89	— .010
165	49.53	3.47	20.76	56.36	46.14	22.21	+ .023
192	50.30	4.23	21.52	57.10	46.88	22.03	.030
219	51.15	5.10	22.38	57.96	47.74	23.79	.031
246	51.97	5.92	23.21	58.82	48.60	24.66	.029
274	52.68	6.64	23.94	59.58	49.38	25.44	.023
301	53.16	7.14	24.45	60.14	49.97	26.04	.016
328	53.43	7.41	24.75	60.49	50.34	26.41	+ .008
356	53.44	7.42	24.79	60.57	50.44	26.53	— .002
Dec. =	+ 19° 12'	+ 20° 32'	+ 20° 39'	+ 22° 45'	+ 23° 41'	+ 23° 41'	
Mag. =	4.5	4.5	5	6	4	3	
	Δ^1 Tauri.	ω^3 Tauri.	δ^1 Tauri.	ν^1 Tauri.	ϵ Tauri.	α Tauri.	
	$3^h 56^m$	$4^h 9^m$	$4^h 15^m$	$4^h 18^m$	$4^h 20^m$	$4^h 28^m$	
	
1	38.34	16.67	4.55	9.19	39.56	6.16	— .004
28	38.09	16.45	4.34	8.98	39.36	5.98	.012
55	37.66	16.03	3.93	8.56	38.95	5.58	.016
84	37.10	15.55	3.45	8.06	38.45	5.08	— .012
193	38.10	16.33	4.16	8.78	39.13	5.68	+ .026
220	38.94	17.15	4.96	9.59	39.92	6.45	.031
247	39.79	17.99	5.79	10.45	40.76	7.27	.030
275	40.59	18.80	6.59	11.28	41.57	8.08	.027
302	41.20	19.44	7.22	11.95	42.23	8.74	.021
329	41.62	19.88	7.67	12.43	42.70	9.22	.012
357	41.77	20.06	7.87	12.64	42.92	9.45	+ .001
Dec. =	+ 21° 42'	+ 20° 14'	+ 17° 13'	+ 22° 30'	+ 18° 52'	+ 16° 14'	
Mag. =	5.4	6.5	4	5.4	4.3	1	
	τ Tauri.	ι Tauri.	ϵ Aurigæ.	ϵ Tauri.	11 Orionis.	π Tauri.	
	$4^h 34^m$	$4^h 43^m$	$4^h 48^m$	$4^h 54^m$	$4^h 56^m$	$5^h 11^m$	
	
2	4.05	24.19	7.34	57.20	47.01	5.55	— .003
29	3.85	24.02	7.15	57.06	46.87	5.44	.011
56	3.43	23.62	6.70	56.66	46.49	5.05	.017
84	2.94	23.13	6.14	56.16	46.00	4.54	.015
112	2.59	22.78	5.73	55.78	45.63	4.14	— .008
221	4.33	24.39	7.49	57.32	47.09	5.54	+ .028
248	5.19	25.22	8.43	58.16	47.90	6.37	.031
275	6.00	26.02	9.33	58.98	48.69	7.20	.029
303	6.73	26.74	10.16	59.74	49.42	8.00	.024
330	7.24	27.26	10.76	60.30	49.96	8.60	.016
357	7.48	27.53	11.06	60.61	50.26	8.94	+ .006
Dec. =	+ 22° 39'	+ 18° 36'	+ 32° 57'	+ 21° 23'	+ 15° 13'	+ 21° 57'	
Mag. =	4.5	5.6	3	5	5	6	
	β Tauri.	σ Tauri.	ζ Tauri.	129 Tauri.	136 Tauri.	1 Geminorum	
	$5^h 17^m$	$5^h 19^m$	$5^h 29^m$	$5^h 38^m$	$5^h 44^m$	$5^h 55^m$	
	
2	40.83	27.19	30.22	55.52	45.90	50.40	+ .003
30	40.72	27.09	30.14	55.47	45.86	50.39	— .009
57	40.32	26.71	29.78	55.13	45.50	50.08	.017
85	39.77	26.19	29.26	54.59	44.95	49.53	.017
113	39.35	25.79	28.84	54.21	44.50	49.08	— .010
222	40.80	27.15	30.11	55.33	45.68	50.12	+ .026
249	41.67	27.98	30.92	56.11	46.52	50.91	.031
276	42.56	28.81	31.76	56.92	47.40	51.76	.030
304	43.40	29.61	32.56	57.72	48.27	52.62	.027
331	44.04	30.23	33.20	58.35	48.97	53.32	.020
358	44.42	30.59	33.58	58.75	49.42	53.79	+ .009
Dec. =	+ 28° 29'	+ 21° 49'	+ 21° 3'	+ 15° 45'	+ 27° 34'	+ 23° 16'	
Mag. =	2	6	3	6	5	5	

322 MOON-CULMINATING STARS.

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	γ Geminorum.	κ Aurigæ.	μ Geminorum.	ν Geminorum.	49 Aurigæ.	δ Geminorum.	
	ϕ 6 ^a	ϕ 6 ^a	ϕ 14 ^a	ϕ 20 ^a	ϕ 26 ^a	ϕ 35 ^a	
3	39.11	41.88	43.11	52.41	37.11	33.04	+ .010
30	39.12	41.89	43.14	52.45	37.17	33.13	— .005
58	38.78	41.53	42.82	52.15	36.85	32.84	.015
86	38.27	40.99	42.31	51.65	36.33	32.33	.018
113	37.83	40.52	41.87	51.21	35.85	31.87	— .012
222	38.76	41.49	42.72	51.99	36.62	32.53	+ .025
250	39.57	42.35	43.52	52.76	37.44	33.31	.030
277	40.41	43.25	44.36	53.59	38.31	34.16	.032
304	41.24	44.13	45.20	54.42	39.20	35.04	.030
332	41.99	44.92	45.96	55.18	40.02	35.86	.024
359	42.47	45.43	46.46	55.69	40.58	36.42	+ .012
Dec. =	+ 22° 33'	+ 29° 33'	+ 22° 35'	+ 20° 18'	+ 28° 8'	+ 25° 16'	
Mag. =	4	5.4	3	5.4	6.5	3.4	
	ω Geminorum.	ζ Geminorum.	τ Geminorum.	δ Geminorum.	ϵ Geminorum.	α^2 Geminor.	
	ϕ 54 ^a	ϕ 56 ^a	γ 2 ^a	γ 11 ^a	γ 17 ^a	γ 25 ^a	
4	6.57	1.69	27.99	59.13	15.84	54.42	+ .015
31	6.69	1.81	28.14	59.30	16.03	54.64	— .001
59	6.43	1.56	27.88	59.08	15.82	54.44	.013
87	5.94	1.09	27.38	58.62	15.34	53.95	.018
114	5.46	0.62	26.86	58.15	14.84	53.42	.022
142	4.86	0.02	26.15	57.42	14.04	52.52	— .015
251	6.75	1.85	28.11	59.21	15.88	54.39	+ .028
278	7.58	2.66	28.98	60.02	16.72	55.25	.032
305	8.46	3.51	29.90	60.88	17.63	56.19	.032
333	9.30	4.34	30.80	61.74	18.56	57.13	.028
360	9.90	4.93	31.45	62.37	19.20	57.85	+ .018
Dec. =	+ 24° 24'	+ 20° 46'	+ 30° 28'	+ 22° 14'	+ 28° 4'	+ 32° 11'	
Mag. =	6	4	5.4	3.4	4	2.1	
	β Geminorum.	φ Geminorum.	6 Cancri.	12 Cancri.	ζ^1 Cancri.	λ Cancri.	
	γ 36 ^a	γ 45 ^a	γ 55 ^a	ϕ 1 ^a	ϕ 4 ^a	ϕ 12 ^a	
5	58.56	9.43	8.85	5.41	23.76	25.76	+ .018
32	58.79	9.68	9.13	5.69	24.05	26.09	+ .003
60	58.61	9.53	9.00	5.58	23.95	26.01	— .009
88	58.15	9.09	8.57	5.20	23.57	25.63	.016
115	57.64	8.59	8.07	4.75	23.12	25.15	.016
143	57.27	8.22	7.69	4.41	22.76	24.77	— .009
252	58.49	9.36	8.73	5.30	23.64	25.61	+ .024
279	59.30	10.15	9.52	6.01	24.36	26.34	.030
306	60.20	11.05	10.42	6.83	25.20	27.21	.033
334	61.13	11.96	11.30	7.70	26.09	28.14	.030
361	61.84	12.70	12.12	8.39	26.81	28.91	+ .023
Dec. =	+ 28° 21'	+ 27° 7'	+ 28° 11'	+ 14° 2'	+ 18° 4'	+ 24° 27'	
Mag. =	1.2	5	5	6	5.4	6	
	δ Cancri.	γ Cancri.	δ Cancri.	ϵ^2 Cancri.	α Cancri.	κ Cancri.	
	ϕ 23 ^a	ϕ 35 ^a	ϕ 36 ^a	ϕ 47 ^a	ϕ 51 ^a	ϕ 0 ^a	
6	49.48	23.84	56.30	29.49	1.97	21.98	+ .020
33	49.81	24.21	56.67	29.92	2.36	22.39	+ .007
61	49.75	24.19	56.65	29.92	2.38	22.43	— .006
89	49.41	23.85	56.32	29.59	2.09	22.16	.014
116	48.95	23.39	55.88	29.11	1.67	21.76	.016
144	48.58	23.01	55.50	28.69	1.30	21.39	— .010
253	49.31	23.64	56.11	29.22	1.76	21.76	+ .021
280	50.01	24.33	56.78	29.92	2.39	22.37	.028
307	50.84	25.17	57.60	30.79	3.18	23.14	.031
335	51.75	26.10	58.52	31.77	4.07	24.03	.031
362	52.50	26.89	59.30	32.62	4.85	24.82	+ .026
Dec. =	+ 18° 33'	+ 21° 58'	+ 18° 39'	+ 28° 27'	+ 12° 23'	+ 11° 13'	
Mag. =	6	4.5	4	6	4	5	

MOON-CULMINATING STARS. 323

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	ξ Cancri.	83 Cancri.	λ Leonis.	ξ Leonis.	ο Leonis.	σ Leonis.	
	9 ^h 1 ^m	9 ^h 11 ^m	9 ^h 23 ^m	9 ^h 24 ^m	9 ^h 33 ^m	9 ^h 38 ^m	
d	31.19	22.23	56.42	35.91	52.68	6.66	+ .024
7	31.63	22.68	56.93	36.38	53.17	7.20	+ .011
34	31.67	22.74	57.03	36.48	53.29	7.34	— .002
61	31.37	22.48	56.78	36.25	53.09	7.13	.012
90	30.94	22.07	56.37	35.88	52.73	6.73	.015
117	30.57	21.69	55.97	35.51	52.37	6.33	.012
144	30.31	21.45	55.70	35.26	52.11	6.03	— .005
172	31.60	22.61	56.76	36.25	53.02	6.96	+ .025
281	32.42	23.40	57.56	37.01	53.76	7.74	.031
308	33.37	24.32	58.51	37.91	54.65	8.69	.032
336	34.19	25.14	59.38	38.72	55.48	9.58	+ .030
363							
Dec. =	+ 22° 36'	+ 18° 17'	+ 23° 34'	+ 11° 54'	+ 11° 31'	+ 24° 24'	
Mag. =	5	6	5.4	6	4.3	3	
	ν Leonis.	η Leonis.	α Leonis.	γ ¹ Leonis.	45 Leonis.	ρ Leonis.	
	9 ^h 50 ^m	9 ^h 59 ^m	10 ^h 1 ^m	10 ^h 12 ^m	10 ^h 20 ^m	10 ^h 25 ^m	
8	53.33	53.94	6.78	27.09	26.87	37.89	+ .029
35	53.86	54.50	7.33	27.69	27.46	38.49	.014
62	54.01	54.68	7.51	27.91	27.69	38.74	+ .002
91	53.84	54.53	7.36	27.79	27.60	38.66	— .008
118	53.49	54.19	7.04	27.46	27.31	38.38	.013
145	53.14	53.82	6.68	27.09	26.97	38.04	.012
173	52.86	53.53	6.40	26.78	26.68	37.75	— .007
282	53.64	54.23	7.01	27.36	27.16	38.19	+ .022
309	54.37	54.96	7.78	28.08	27.84	38.85	.029
337	55.27	55.87	8.68	29.00	28.72	39.73	.032
364	56.12	56.74	9.53	29.90	29.59	40.60	+ .030
Dec. =	+ 13° 6'	+ 17° 26'	+ 12° 38'	+ 20° 32'	+ 10° 29'	+ 10° 1'	
Mag. =	5	3.4	1.2	2	6	4	
	37 Sextantis.	ι Leonis.	ε Leonis.	χ Leonis.	π Leonis.	σ Leonis.	
	10 ^h 38 ^m	10 ^h 42 ^m	10 ^h 53 ^m	10 ^h 57 ^m	11 ^h 8 ^m	11 ^h 14 ^m	
9	59.75	5.21	40.82	58.99	43.66	6.13	+ .031
36	60.36	5.84	41.47	59.64	44.35	6.82	.018
63	60.63	6.12	41.77	59.96	44.70	7.18	+ .006
92	60.57	6.07	41.76	59.96	44.73	7.22	— .004
119	60.32	5.81	41.53	59.74	44.52	7.04	.010
147	59.98	5.48	41.21	59.42	44.20	6.74	.011
174	59.70	5.19	40.92	59.13	43.90	6.45	.010
201	59.52	5.00	40.72	58.92	43.67	6.22	— .005
310	60.69	6.14	41.75	59.89	44.56	7.05	+ .027
338	61.55	7.02	42.60	60.75	45.41	7.88	.032
365	62.41	7.89	43.47	61.61	46.30	8.75	+ .032
Dec. =	+ 7° 6'	+ 11° 16'	+ 6° 50'	+ 8° 5'	+ 14° 3'	+ 6° 47'	
Mag. =	6	5	5	5	6	4	
	ι Leonis.	τ Leonis.	ν Virginis.	β Virginis.	π Virginis.	ο Virginis.	
	11 ^h 16 ^m	11 ^h 20 ^m	11 ^h 38 ^m	11 ^h 43 ^m	11 ^h 53 ^m	11 ^h 58 ^m	
10	48.80	55.47	50.90	35.31	52.87	15.57	+ .031
37	49.49	56.15	51.62	36.04	53.62	16.32	.021
64	49.85	56.52	52.03	36.46	54.07	16.79	+ .010
93	49.89	56.57	52.13	36.58	54.21	16.94	.000
120	49.70	56.40	52.00	36.47	54.11	16.85	— .007
147	49.41	56.12	51.74	36.23	53.88	16.62	.010
175	49.10	55.83	51.44	35.94	53.58	16.32	.010
202	48.87	55.59	51.19	35.69	53.32	16.05	— .006
311	49.71	56.39	51.81	36.28	53.79	16.47	+ .024
339	50.55	57.22	52.62	37.08	54.58	17.25	.031
366	51.44	58.09	53.50	37.96	55.45	18.13	+ .032
Dec. =	+ 11° 17'	+ 3° 37'	+ 7° 18'	+ 2° 32'	+ 7° 23'	+ 9° 30'	
Mag. =	4	5	4.5	3.4	4.5	4	

324 MOON-CULMINATING STARS.

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	Piazzi xii. 6.	13 Virginis.	η Virginis.	c Virginis.	q Virginis.	γ Virginis.	
	12 ^h 4 ^m	12 ^h 11 ^m	12 ^h 12 ^m	12 ^h 13 ^m	12 ^h 26 ^m	12 ^h 34 ^m	
d	.	.	.	.	.	.
11	41.00	40.52	55.30	25.18	44.28	44.70	+ .031
38	41.74	41.27	56.05	25.94	45.05	45.48	.024
65	42.22	41.76	56.55	26.43	45.58	46.02	.013
94	42.38	41.94	56.73	26.62	45.81	46.27	+ .003
121	42.30	41.89	56.68	26.56	45.80	46.27	— .004
148	42.09	41.69	56.48	26.36	45.63	46.11	.009
176	41.80	41.41	56.21	26.08	45.36	45.85	.010
203	41.53	41.13	55.93	25.80	45.07	45.56	.009
230	41.32	40.92	55.71	25.58	44.83	45.31	— .005
312	41.93	41.48	56.26	26.12	45.28	45.67	+ .011
339	42.68	42.22	57.00	26.85	46.01	46.37	+ .029
Dec. =	+ 4° 49'	— 0° 2'	+ 0° 6'	+ 4° 5'	— 8° 42'	— 0° 42'	
Mag. =	6.7	6	3.4	5	6	3.2	
	38 Virginis.	ψ Virginis.	δ Virginis.	θ Virginis.	α Virginis.	ζ Virginis.	
	12 ^h 46 ^m	12 ^h 47 ^m	12 ^h 48 ^m	13 ^h 2 ^m	13 ^h 18 ^m	13 ^h 27 ^m	
	
12	11.98	15.54	43.71	52.96	0.11	44.17	+ .030
39	12.77	16.33	44.50	53.78	0.92	45.00	.026
66	13.31	16.89	45.05	54.36	1.54	45.63	.016
94	13.59	17.18	45.33	54.69	1.92	46.02	+ .007
122	13.62	17.22	45.41	54.77	2.04	46.16	.000
149	13.48	17.08	45.22	54.66	1.97	46.10	— .006
177	13.23	16.83	44.96	54.43	1.76	45.90	.010
204	12.94	16.54	44.67	54.14	1.46	45.60	.011
231	12.67	16.27	44.39	53.85	1.15	45.28	— .008
313	13.00	16.59	44.68	54.05	1.25	45.29	+ .008
340	13.69	17.30	45.36	54.72	1.89	45.90	+ .027
Dec. =	— 2° 48'	— 8° 48'	+ 4° 9'	— 4° 48'	— 10° 27'	+ 0° 6'	
Mag. =	6	5	3	4.5	1	3.4	
	μ Virginis.	86 Virginis.	89 Virginis.	94 Virginis.	κ Virginis.	λ Virginis.	
	13 ^h 34 ^m	13 ^h 38 ^m	13 ^h 42 ^m	13 ^h 59 ^m	14 ^h 5 ^m	14 ^h 11 ^m	
	
13	26.78	39.79	27.23	3.80	36.71	43.24	+ .031
40	27.62	40.64	28.10	4.66	37.58	44.12	.029
67	28.26	41.30	28.78	5.35	38.28	44.84	.021
95	28.67	41.72	29.22	5.81	38.77	45.34	.012
123	28.83	41.90	29.42	6.05	39.02	45.62	+ .004
150	28.79	41.87	29.40	6.07	39.06	45.67	— .003
177	28.60	41.69	29.22	5.91	38.92	45.55	.008
205	28.30	41.39	28.91	5.62	38.63	45.26	.011
232	27.97	41.05	28.56	5.28	38.27	44.90	.012
259	27.72	40.79	28.28	4.98	37.97	44.58	— .006
341	28.59	41.65	29.15	5.67	38.62	45.19	+ .025
Dec. =	— 8° 1'	— 11° 44'	— 17° 27'	— 8° 14'	— 9° 38'	— 12° 44'	
Mag. =	6	6	5	6	4.5	5.4	
	μ Virginis.	5 Libræ.	μ Libræ.	α Libræ.	ξ Libræ.	20 Libræ.	
	14 ^h 35 ^m	14 ^h 38 ^m	14 ^h 41 ^m	14 ^h 43 ^m	14 ^h 49 ^m	14 ^h 56 ^m	
	
14	51.57	25.80	49.89	19.28	21.22	4.64	+ .032
41	52.42	26.69	50.78	20.17	22.10	5.58	.031
68	53.16	27.45	51.54	20.94	22.86	6.41	.025
	53.71	28.03	52.12	21.53	23.45	7.07	.017
12	54.02	28.36	52.47	21.88	23.81	7.48	.009
151	54.12	28.48	52.59	22.01	23.95	7.66	+ .001
178	54.02	28.39	52.51	21.94	23.89	7.61	— .007
206	53.75	28.12	52.24	21.67	23.63	7.34	.012
233		27.74	51.87	21.29	23.26	6.93	.014
260	53.44	27.38	51.51	20.92	22.89	6.51	— .010
342	53.48	27.83	51.93	21.33	23.24	6.86	+ .020
Dec. =	— 5° 4'	— 14° 53'	— 13° 34'	— 15° 28'	— 10° 51'	— 24° 44'	
Mag. =	4	6	6	2.3	6	3.4	

MOON-CULMINATING STARS. 325

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	ϵ^1 Libræ. 15 ^h 4 ^m	ζ^1 Libræ. 15 ^h 20 ^m	γ Libræ. 15 ^h 27 ^m	κ Libræ. 15 ^h 34 ^m	η Libræ. 15 ^h 36 ^m	λ Libræ. 15 ^h 45 ^m	
d	^h	^h	^h	^h	^h	^h	
14	25.95	32.82	52.58	4.24	23.12	23.84	+ .033
41	26.86	33.71	53.46	5.14	24.00	24.74	.032
69	27.70	34.56	54.31	6.01	24.85	25.62	.028
97	28.34	35.23	54.98	6.72	25.54	26.35	.021
124	28.74	35.66	55.43	7.20	26.02	26.85	.013
152	28.94	35.90	55.68	7.47	26.29	27.17	+ .005
179	29.90	35.89	55.69	7.50	26.32	27.22	— .004
206	28.66	35.67	55.49	7.30	26.13	27.04	.011
234	28.25	35.28	55.10	6.90	25.74	26.64	.015
261	27.85	34.86	54.68	6.47	25.32	26.20	— .013
343	28.15	35.04	54.79	6.55	25.37	26.19	+ .014
Dec. =	— 19° 16'	— 16° 14'	— 14° 20'	— 19° 14'	— 15° 14'	— 19° 45'	
Mag. =	5.4	4	4.5	5	6	6	
	ϵ Scorpii. 15 ^h 48 ^m	δ Scorpii. 15 ^h 52 ^m	β^1 Scorpii. 15 ^h 57 ^m	σ Scorpii. 16 ^h 12 ^m	α Scorpii. 16 ^h 21 ^m	τ Scorpii. 16 ^h 27 ^m	
	^h	^h	^h	^h	^h	^h	
15	26.80	14.90	29.06	52.53	1.28	22.16	+ .033
42	27.76	15.81	29.95	53.44	2.19	23.08	.034
69	28.66	16.68	30.80	54.34	3.08	24.00	.031
98	29.48	17.45	31.57	55.17	3.94	24.87	.025
125	30.04	17.99	32.11	55.78	4.57	25.53	.018
152	30.36	18.30	32.43	56.15	4.97	25.95	+ .009
180	30.42	18.37	32.51	56.28	5.12	26.12	— .001
207	30.21	18.19	32.34	56.12	4.98	25.99	.010
234	29.80	17.80	31.97	55.74	4.61	25.61	.016
262	29.30	17.33	31.50	55.25	4.10	25.10	.016
289	28.95	16.99	31.16	54.86	3.69	24.68	— .010
Dec. =	— 28° 48'	— 23° 14'	— 19° 26'	— 25° 16'	— 26° 7'	— 27° 56'	
Mag. =	5.4	2.3	2	3.4	1.2	3.4	
	24 Scorpii. 16 ^h 33 ^m	20 Ophiuchi. 16 ^h 42 ^m	η Ophiuchi. 17 ^h 2 ^m	Λ Ophiuchi. 17 ^h 6 ^m	ξ Ophiuchi. 17 ^h 12 ^m	δ Ophiuchi. 17 ^h 13 ^m	
	^h	^h	^h	^h	^h	^h	
16	39.59	15.78	31.73	56.09	48.06	36.26	+ .030
43	40.44	16.59	32.53	56.94	48.87	37.10	.032
70	41.28	17.40	33.36	57.84	49.74	37.98	.031
98	42.07	18.18	34.18	58.72	50.58	38.85	.027
126	42.71	18.81	34.87	59.47	51.31	39.61	.022
153	43.11	19.22	35.34	59.98	51.82	40.14	.014
180	43.27	19.39	35.57	60.24	52.10	40.42	+ .004
208	43.16	19.29	35.51	60.19	52.07	40.39	— .007
235	42.81	18.96	35.20	59.86	51.76	40.07	.015
262	42.34	18.50	34.74	59.36	51.29	39.59	.017
290	41.94	18.09	34.29	58.88	50.82	39.10	— .014
Dec. =	— 17° 28'	— 10° 32'	— 15° 33'	— 26° 24'	— 20° 58'	— 24° 52'	
Mag. =	5	5	2.3	5	5	3.4	
	δ Ophiuchi. 17 ^h 18 ^m	ϵ^o Ophiuchi. 17 ^h 23 ^m	σ Serpents. 17 ^h 33 ^m	4 Sagittarii. 17 ^h 51 ^m	9 Sagittarii. 17 ^h 55 ^m	γ Sagittarii. 17 ^h 57 ^m	
	^h	^h	^h	^h	^h	^h	
16	0.60	3.99	43.20	25.84	28.56	0.83	+ .027
44	1.55	4.84	43.97	26.63	29.34	1.65	.031
71	2.43	5.71	44.78	27.48	30.20	2.56	.031
99	3.29	6.58	45.60	28.38	31.09	3.51	.030
126	4.02	7.32	46.31	29.16	31.88	4.33	.026
154	4.57	7.88	46.86	29.79	32.53	5.02	.018
181	4.85	8.18	47.15	30.16	32.91	5.42	+ .007
209	4.82	8.16	47.15	30.21	32.97	5.48	— .005
236	4.51	7.85	46.87	29.94	32.71	5.21	.014
263	4.02	7.37	46.42	29.47	32.24	4.72	.018
290	3.56	6.90	45.97	28.98	31.74	4.19	— .017
Dec. =	— 24° 3'	— 23° 51'	— 12° 48'	— 23° 48'	— 24° 22'	— 30° 25'	
Mag. =	5	5	5.4	5	5.4	3.4	

326 MOON-CULMINATING STARS.

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	μ^1 Sagittarii.	δ Sagittarii.	λ Sagittarii.	Bradley 2333.	ϕ Sagittarii.	29 Sagittarii.	
	18 ^h 5 ^m	18 ^h 12 ^m	18 ^h 19 ^m	18 ^h 30 ^m	18 ^h 37 ^m	18 ^h 41 ^m	
44	35.08	14.27	31.85	11.44	6.70	32.98	+ .030
72	35.94	15.18	32.73	12.28	7.56	33.80	.031
100	36.81	16.12	33.64	13.19	8.49	34.66	.030
127	37.59	16.97	34.46	14.00	9.33	35.48	.028
154	38.22	17.66	35.13	14.69	10.06	36.17	.022
182	38.62	18.11	35.59	15.17	10.57	36.67	+ .011
209	38.70	18.20	35.70	15.31	10.73	36.83	— .002
237	38.45	17.95	35.47	15.11	10.54	36.66	.012
264	37.99	17.47	35.02	14.67	10.09	36.24	.018
291	37.51	16.94	34.51	14.16	9.57	35.75	.019
318	37.19	16.59	34.16	13.80	9.19	35.38	— .018
Dec. =	— 21° 5'	— 29° 53'	— 25° 30'	— 23° 37'	— 27° 8'	— 20° 29'	
Mag. =	4	3.4	3	6	4.3	6	
	ν^1 Sagittarii.	σ Sagittarii.	ζ Sagittarii.	τ Sagittarii.	χ^1 Sagittarii.	λ^2 Sagittarii.	
	18 ^h 45 ^m	18 ^h 46 ^m	18 ^h 53 ^m	18 ^h 58 ^m	19 ^h 16 ^m	19 ^h 28 ^m	
45	54.59	47.04	54.56	23.89	56.66	22.66	+ .025
72	55.38	47.85	55.38	24.70	57.40	23.38	.030
101	56.30	48.80	56.36	25.64	58.33	24.30	.034
128	57.14	49.66	57.25	26.51	59.19	25.18	.031
155	57.84	50.38	58.01	27.27	59.96	25.96	.025
183	58.34	50.90	58.56	27.83	60.55	26.58	.014
210	58.51	51.08	58.76	28.04	60.80	26.87	+ .002
237	58.34	50.90	58.60	27.89	60.70	26.79	— .010
265	57.90	50.46	58.14	27.45	60.30	26.41	.017
292	57.40	49.94	57.61	26.92	59.79	25.91	.018
319	57.03	49.55	57.20	26.52	59.38	25.48	— .015
Dec. =	— 22° 55'	— 26° 28'	— 30° 4'	— 27° 52'	— 24° 46'	— 25° 11'	
Mag. =	5	2.3	3.4	4.3	6	5.4	
	ϵ^2 Sagittarii.	ζ Sagittarii.	δ Sagittarii.	A Sagittarii	c Sagittarii.	Piazzi xix. 366.	
	19 ^h 34 ^m	19 ^h 38 ^m	19 ^h 48 ^m	19 ^h 50 ^m	19 ^h 54 ^m	19 ^h 55 ^m	
46	41.46	22.61	32.74	36.65	14.28	39.07	+ .018
73	42.13	23.29	33.43	37.34	14.97	39.79	.028
101	42.96	24.13	34.31	38.20	15.84	40.69	.032
128	43.79	24.98	35.20	39.09	16.74	41.63	.032
156	44.56	25.77	36.06	39.94	17.61	42.53	.028
183	45.13	26.37	36.71	40.59	18.28	43.23	.018
211	45.42	26.67	37.06	40.94	18.64	43.61	+ .006
238	45.36	26.62	37.02	40.91	18.62	43.59	— .007
265	45.01	26.27	36.68	40.57	18.28	43.23	.016
293	44.53	25.78	36.15	40.06	17.76	42.70	.017
320	44.12	25.36	35.70	39.61	17.31	42.22	— .014
Dec. =	— 16° 26'	— 20° 5'	— 27° 32'	— 26° 34'	— 26° 5'	— 32° 26'	
Mag. =	5	5	5	5	5	5	
	α^2 Capricorni.	π Capricorni.	ϵ Capricorni.	ν Capricorni.	ψ Capricorni.	ω Capricorni.	
	20 ^h 10 ^m	20 ^h 19 ^m	20 ^h 21 ^m	20 ^h 32 ^m	20 ^h 37 ^m	20 ^h 43 ^m	
74	28.02	29.60	3.60	15.81	59.77	39.29	+ .023
102	28.79	30.39	4.38	16.58	60.56	40.09	.030
129	29.61	31.23	5.21	17.41	61.44	40.96	.031
156	30.39	32.04	6.03	18.24	62.30	41.84	.029
184	31.05	32.73	6.72	18.96	63.06	42.63	.021
211	31.40	33.12	7.11	19.37	63.52	43.10	+ .009
239	31.41	33.16	7.16	19.45	63.61	43.21	— .004
266	31.13	32.89	6.89	19.20	63.36	42.97	.013
293	30.69	32.44	6.45	18.77	62.91	42.52	.016
321	30.26	32.00	6.00	18.32	62.44	42.04	.013
348	30.04	31.75	5.76	18.06	62.14	41.73	— .005
Dec. =	— 12° 58'	— 18° 39'	— 18° 16'	— 18° 37'	— 25° 46'	— 27° 26'	
Mag. =	3.4	5	5	6.5	4.5	4.5	

MOON-CULMINATING STARS. 327

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	♈ Aquarii.	♐ Capricorni.	♐ Capricorni.	♐ Capricorni.	♐ Capricorni.	♐ Capricorni.	
	21 ^h 2 ^m	21 ^h 14 ^m	21 ^h 18 ^m	21 ^h 29 ^m	21 ^h 32 ^m	21 ^h 39 ^m	
d	°	°	°	°	°	°	
75	8.47	37.81	51.90	25.09	30.64	29.20	+ .017
103	9.16	38.49	51.90	25.76	31.29	29.83	.027
130	10.00	39.31	52.74	26.56	32.09	30.62	.030
157	10.79	40.16	53.61	27.44	32.95	31.48	.030
185	11.52	40.93	54.41	28.24	33.75	32.28	.024
212	11.98	41.43	54.94	28.78	34.29	32.84	.013
240	12.12	41.61	55.13	29.00	34.52	33.08	+ .001
267	11.93	41.45	54.98	28.88	34.40	32.99	— .009
294	11.55	41.08	54.60	28.52	34.06	32.66	.014
322	11.13	40.64	54.14	28.08	33.63	32.24	.013
349	10.84	40.33	53.81	27.75	33.31	31.91	— .010
Dec. =	— 11° 55'	— 17° 25'	— 23° 0'	— 20° 5'	— 17° 17'	— 16° 45'	
Mag. =	4.5	4.5	4	5.4	4.3	3	
	♑ Capricorni.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	
	21 ^h 45 ^m	21 ^h 59 ^m	22 ^h 9 ^m	22 ^h 12 ^m	22 ^h 19 ^m	22 ^h 23 ^m	
75	50.10	2.76	36.75	59.87	8.57	24.24	+ .010
104	50.74	3.36	37.31	60.42	9.13	24.75	.023
131	51.51	4.12	38.05	61.15	9.87	25.47	.029
158	52.36	4.97	38.88	61.99	10.72	26.33	.031
186	53.16	5.78	39.69	62.80	11.57	27.16	.026
213	53.72	6.36	40.28	63.40	12.20	27.78	.017
240	53.96	6.64	40.58	63.70	12.53	28.12	+ .005
268	53.87	6.59	40.55	63.69	12.53	28.13	— .006
295	53.56	6.29	40.29	63.43	12.28	27.89	.012
322	53.16	5.90	39.92	63.07	11.90	27.53	.013
350	52.83	5.56	39.59	62.73	11.54	27.19	— .014
Dec. =	— 14° 12'	— 14° 32'	— 8° 28'	— 8° 30'	— 17° 26'	— 11° 23'	
Mag. =	5	4	4.5	5.6	6	5.4	
	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	
	22 ^h 30 ^m	22 ^h 42 ^m	22 ^h 47 ^m	22 ^h 7 ^m	23 ^h 9 ^m	23 ^h 11 ^m	
21	39.98	20.40	22.87	14.07	43.09	50.42	— .003
106	40.77	21.12	23.54	14.58	43.59	50.89	+ .020
132	41.48	21.82	24.24	15.23	44.24	51.53	.026
159	42.30	22.66	25.08	16.04	45.05	52.34	.031
186	43.09	23.48	25.92	16.86	45.88	53.17	.028
214	43.74	24.16	26.62	17.57	46.60	53.90	.020
241	44.07	24.54	27.01	17.99	47.03	54.33	+ .009
269	44.09	24.59	27.07	18.11	47.16	54.47	— .002
296	43.87	24.38	26.87	17.97	47.02	54.33	.009
323	43.53	24.04	26.53	17.68	46.73	54.04	.012
350	43.20	23.69	26.18	17.35	46.40	53.71	— .015
Dec. =	— 4° 56'	— 14° 19'	— 16° 33'	— 6° 47'	— 9° 50'	— 10° 22'	
Mag. =	5	4	3	4.5	5.4	5	
	♈ Piscium.	♈ Piscium.	♈ Piscium.	♈ Piscium.	♈ Piscium.	♈ Piscium.	
	23 ^h 19 ^m	23 ^h 35 ^m	23 ^h 40 ^m	23 ^h 51 ^m	23 ^h 54 ^m	23 ^h 58 ^m	
22	55.12	4.14	54.44	40.10	56.72	20.09	— .007
106	55.55	4.45	54.70	40.28	56.87	20.21	+ .017
133	56.18	5.05	55.30	40.85	57.44	20.77	.024
160	56.99	5.84	56.08	41.62	58.21	21.54	.030
187	57.80	6.67	56.91	42.45	59.04	22.37	.029
215	58.52	7.41	57.66	43.22	59.81	23.15	.023
242	58.96	7.88	58.15	43.73	60.34	23.67	.013
270	59.11	8.07	58.35	43.97	60.58	23.93	+ .002
297	58.99	7.99	58.29	43.93	60.55	23.90	— .005
324	58.73	7.75	58.05	43.71	60.32	23.70	.010
351	58.41	7.44	57.73	43.41	60.03	23.40	— .014
Dec. =	+ 0° 30'	+ 1° 2'	— 3° 31'	— 4° 19'	— 6° 47'	— 6° 29'	
Mag. =	5.4	5	6	5.6	5	5	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

JANUARY.						FEBRUARY.					
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	
d				^h ^m	^m				^h ^m	^m	
1.0	14' 47.1	54' 8.4	—0.49	U. 9 42.1	2.04	14' 48.4	54' 13.5	+0.48	U. 10 50.7	1.94	
1.5	14 45.7	54 3.4	0.35	L. 22 6.5	2.03	14 50.1	54 20.0	0.59	L. 23 13.8	1.92	
2.0	14 44.7	54 0.1	0.21	U. 10 31.0	2.03	14 52.5	54 27.7	0.69	U. 11 36.8	1.89	
2.5	14 44.1	53 58.4	—0.09	L. 22 55.4	2.03	14 54.8	54 36.5	0.78	L. 23 59.1	1.87	
3.0	14 43.9	53 58.1	+0.03	U. 11 19.7	2.02	14 57.4	54 46.4	0.86			
3.5	14 44.2	53 59.1	0.14	L. 23 43.8	2.00	15 0.4	54 57.1	0.92	U. 12 21.5	1.85	
4.0	14 45.0	54 1.4	0.24			15 3.4	55 8.6	0.99	L. 0 43.6	1.84	
4.5	14 46.0	54 4.8	0.34	U. 12 7.6	1.96	15 6.8	55 20.8	1.05	U. 13 5.7	1.83	
5.0	14 47.4	54 9.6	0.45	L. 0 31.0	1.93	15 10.2	55 33.7	1.10	L. 1 27.6	1.83	
5.5	14 49.0	54 15.6	0.55	U. 12 54.1	1.92	15 13.8	55 47.1	1.15	U. 13 49.7	1.84	
6.0	14 50.9	54 22.7	0.64	L. 1 16.9	1.89	15 17.6	56 1.2	1.20	L. 2 11.8	1.85	
6.5	14 53.2	54 30.9	0.74	U. 13 39.4	1.85	15 21.6	56 15.9	1.24	U. 14 34.3	1.88	
7.0	14 55.8	54 40.5	0.85	L. 2 1.5	1.83	15 25.8	56 31.0	1.28	L. 2 57.1	1.91	
7.5	14 58.8	54 51.3	0.95	U. 14 23.5	1.83	15 30.0	56 46.7	1.33	U. 15 20.3	1.95	
8.0	15 2.1	55 3.4	1.07	L. 2 45.3	1.82	15 34.5	57 2.9	1.37	L. 3 43.9	2.00	
8.5	15 5.6	55 17.0	1.19	U. 15 7.0	1.80	15 39.1	57 19.7	1.42	U. 16 8.3	2.07	
9.0	15 9.7	55 31.9	1.31	L. 3 28.6	1.82	15 43.8	57 36.9	1.45	L. 4 33.4	2.13	
9.5	15 14.2	55 48.3	1.43	U. 15 50.5	1.83	15 48.5	57 54.5	1.47	U. 16 59.4	2.20	
10.0	15 19.1	56 6.2	1.55	L. 4 12.6	1.85	15 53.3	58 12.3	1.49	L. 5 26.3	2.27	
10.5	15 24.4	56 25.5	1.66	U. 16 35.1	1.88	15 58.1	58 30.2	1.48	U. 17 54.0	2.33	
11.0	15 29.9	56 46.1	1.76	L. 4 57.9	1.93	16 3.0	58 48.0	1.46	L. 6 22.6	2.40	
11.5	15 35.9	57 8.1	1.86	U. 17 21.6	2.00	16 7.8	59 5.3	1.41	U. 18 51.9	2.46	
12.0	15 42.2	57 31.2	1.95	L. 5 46.0	2.07	16 12.2	59 21.9	1.34	L. 7 21.8	2.50	
12.5	15 48.7	57 55.2	2.03	U. 18 11.4	2.15	16 16.4	59 37.4	1.23	U. 19 52.1	2.53	
13.0	15 55.4	58 19.9	2.08	L. 6 37.7	2.23	16 20.3	59 51.3	1.08	L. 8 22.7	2.53	
13.5	16 2.1	58 45.0	2.08	U. 19 5.0	2.32	16 23.6	60 3.2	0.89	U. 20 53.1	2.52	
14.0	16 8.9	59 9.8	2.03	L. 7 33.3	2.40	16 26.1	60 12.6	0.66	L. 9 23.3	2.50	
14.5	16 15.5	59 33.8	1.95	U. 20 2.6	2.48	16 27.8	60 19.1	0.41	U. 21 53.0	2.45	
15.0	16 21.7	59 56.6	1.81	L. 8 32.9	2.55	16 28.7	60 22.4	+0.13	L. 10 22.3	2.40	
15.5	16 27.4	60 17.3	1.61	U. 21 3.9	2.60	16 28.7	60 22.2	—0.16	U. 22 50.8	2.35	
16.0	16 32.2	60 35.3	1.37	L. 9 35.5	2.63	16 27.7	60 18.5	0.46	L. 11 18.6	2.28	
16.5	16 36.0	60 50.1	1.07	U. 22 7.3	2.63	16 25.7	60 11.1	0.77	U. 23 45.7	2.22	
17.0	16 39.0	61 1.0	0.72	L. 10 39.0	2.62	16 22.7	60 0.0	1.07			
17.5	16 40.9	61 7.5	+0.35	U. 23 10.2	2.58	16 18.8	59 45.4	1.34	L. 12 11.9	2.17	
18.0	16 41.5	61 9.4	—0.03	L. 11 40.9	2.53	16 13.9	59 27.8	1.58	U. 0 37.8	2.13	
18.5	16 40.6	61 6.7	0.42			16 8.4	59 7.5	1.78	L. 13 3.1	2.10	
19.0	16 38.5	60 59.2	0.82	U. 0 10.8	2.47	16 2.4	58 45.1	1.93	U. 1 28.0	2.06	
19.5	16 35.3	60 47.0	1.19	L. 12 39.9	2.38	15 55.8	58 21.1	2.04	L. 13 52.5	2.03	
20.0	16 30.8	60 30.7	1.52	U. 1 8.0	2.30	15 48.9	57 56.0	2.12	U. 2 16.9	2.02	
20.5	16 25.5	60 10.6	1.81	L. 13 35.1	2.23	15 41.9	57 30.3	2.14	L. 14 41.1	2.01	
21.0	16 19.3	59 47.3	2.04	U. 2 1.4	2.17	15 34.9	57 4.7	2.11	U. 3 5.2	2.00	
21.5	16 12.3	59 21.6	2.22	L. 14 27.0	2.10	15 28.2	56 39.7	2.04	L. 15 29.3	2.00	
22.0	16 4.7	58 54.1	2.34	U. 2 52.0	2.05	15 21.7	56 15.7	1.94	L. 3 53.4	2.01	
22.5	15 57.1	58 25.5	2.39	L. 15 16.3	2.00	15 15.6	55 53.1	1.81	L. 16 17.6	2.02	
23.0	15 49.3	57 56.6	2.40	U. 3 40.2	1.99	15 9.9	55 32.2	1.65	U. 4 41.9	2.03	
23.5	15 41.5	57 28.0	2.35	L. 16 3.8	1.98	15 4.8	55 13.4	1.47	L. 17 6.4	2.04	
24.0	15 33.9	57 0.1	2.27	U. 4 27.4	1.98	15 0.2	54 56.9	1.27	U. 5 31.0	2.05	
24.5	15 26.5	56 33.5	2.15	L. 16 50.9	1.97	14 56.5	54 42.8	1.07	L. 17 55.5	2.05	
25.0	15 19.8	56 8.5	2.00	U. 5 14.5	1.97	14 53.2	54 31.1	0.86	U. 6 20.1	2.05	
25.5	15 13.6	55 45.4	1.83	L. 17 38.0	1.97	14 50.8	54 22.0	0.64	L. 18 44.7	2.04	
26.0	15 7.9	55 24.5	1.64	U. 6 1.7	1.97	14 49.0	54 15.6	0.42	U. 7 9.1	2.03	
26.5	15 2.8	55 5.9	1.44	L. 18 25.4	1.98	14 48.0	54 11.8	0.22	L. 19 33.4	2.02	
27.0	14 58.3	54 49.8	1.24	U. 6 49.3	2.00	14 47.6	54 10.4	—0.01	U. 7 57.5	2.00	
27.5	14 54.5	54 36.1	1.04	L. 19 13.3	2.02	14 48.0	54 11.5	+0.19	L. 20 21.3	1.97	
28.0	14 51.5	54 24.8	0.84	U. 7 37.6	2.03	14 48.9	54 14.9	0.37	U. 8 44.9	1.95	
28.5	14 49.2	54 15.9	0.64	L. 20 2.0	2.03	14 50.3	54 20.5	0.55	L. 21 8.2	1.93	
29.0	14 47.4	54 9.4	0.44	U. 8 26.4	2.03	14 52.4	54 28.1	0.71	U. 9 31.3	1.91	
29.5	14 46.2	54 5.2	0.26	L. 20 50.9	2.03	14 54.9	54 37.6	0.86	L. 21 54.1	1.89	
30.0	14 45.7	54 3.1	—0.09	U. 9 15.2	2.02	14 58.0	54 48.7	0.98	U. 10 16.7	1.87	
30.5	14 45.7	54 3.0	+0.07	L. 21 39.4	2.01	15 1.4	55 1.1	1.07	L. 22 39.1	1.87	
31.0	14 46.2	54 4.8	0.22	U. 10 3.5	2.00	15 4.9	55 14.5	1.15	U. 11 1.5	1.85	
31.5	14 47.1	54 8.4	+0.36	L. 22 27.3	1.97	15 8.9	55 28.8	+1.21	L. 23 23.7	1.85	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

MARCH.						APRIL.					
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	
d				^h ^m	m				^h ^m	m	
1.0	14 52.4	54 28.1	+0.71	u. 9 31.3	1.91	15 21.2	56 13.9	+1.63	u. 10 24.1	1.89	
1.5	14 54.9	54 37.6	0.86	L. 21 54.1	1.89	15 26.6	56 33.8	1.66	L. 22 46.9	1.12	
2.0	14 58.0	54 48.7	0.98	u. 10 16.7	1.87	15 32.0	56 53.8	1.66	u. 11 10.3	1.17	
2.5	15 1.4	55 1.1	1.07	L. 22 30.1	1.86	15 37.5	57 13.7	1.63	L. 23 34.1	2.02	
3.0	15 4.9	55 14.5	1.15	u. 11 1.5	1.85	15 42.7	57 33.0	1.57	u. 11 58.6	2.07	
3.5	15 8.9	55 28.8	1.22	L. 23 23.7	1.85	15 47.6	57 51.4	1.49			
4.0	15 13.0	55 43.8	1.27	u. 11 46.0	1.86	15 52.4	58 8.7	1.38	L. 0 23.7	2.12	
4.5	15 17.1	55 59.3	1.30			15 56.7	58 24.5	1.24	u. 12 49.6	2.18	
5.0	15 21.4	56 15.0	1.31	L. 0 8.5	1.88	16 0.5	58 38.5	1.09	L. 1 16.3	2.25	
5.5	15 25.7	56 30.7	1.29	u. 12 31.2	1.90	16 3.8	58 50.7	0.93	u. 13 43.8	2.32	
6.0	15 30.0	56 46.1	1.27	L. 0 54.2	1.93	16 6.5	59 0.9	0.77	L. 2 12.1	2.38	
6.5	15 34.1	57 1.3	1.25	u. 13 17.6	1.97	16 8.8	59 9.2	0.61	u. 14 40.9	2.42	
7.0	15 38.0	57 16.1	1.21	L. 1 41.5	2.01	16 10.5	59 15.5	0.44	L. 3 10.3	2.46	
7.5	15 41.9	57 30.3	1.16	u. 14 5.9	2.05	16 11.7	59 19.9	0.29	u. 15 40.0	2.48	
8.0	15 45.7	57 44.0	1.11	L. 2 30.8	2.12	16 12.4	59 22.4	0.14	L. 4 9.9	2.48	
8.5	15 49.2	57 57.0	1.06	u. 14 56.6	2.18	16 12.6	59 23.2	+0.00	u. 16 39.7	2.47	
9.0	15 52.6	58 9.4	1.00	L. 3 23.2	2.25	16 12.4	59 22.5	-0.12	L. 5 9.4	2.45	
9.5	15 55.8	58 21.0	0.94	u. 15 50.5	2.30	16 11.8	59 20.3	0.24	u. 17 38.5	2.41	
10.0	15 58.7	58 32.0	0.88	L. 4 18.5	2.35	16 10.9	59 16.8	0.34	L. 6 7.1	2.36	
10.5	16 1.5	58 42.2	0.82	u. 16 47.0	2.40	16 9.6	59 12.1	0.43	u. 18 35.2	2.30	
11.0	16 4.0	58 51.7	0.76	L. 5 16.1	2.43	16 8.1	59 6.4	0.52	L. 7 2.6	2.25	
11.5	16 6.3	59 0.5	0.69	u. 17 45.5	2.45	16 6.2	58 59.6	0.61	u. 19 29.1	2.18	
12.0	16 8.5	59 8.4	0.62	L. 6 15.2	2.47	16 4.0	58 51.8	0.69	L. 7 53.0	2.13	
12.5	16 10.4	59 15.3	0.53	u. 18 44.8	2.47	16 1.7	58 43.1	0.76	u. 20 23.5	2.10	
13.0	16 11.9	59 21.1	0.42	L. 7 14.3	2.44	15 59.1	58 33.5	0.84	L. 8 45.3	2.07	
13.5	16 13.2	59 25.5	0.31	u. 19 43.3	2.40	15 56.2	58 22.9	0.92	u. 21 10.0	2.03	
14.0	16 14.0	59 28.5	0.18	L. 8 11.9	2.35	15 53.1	58 11.4	1.00	L. 9 34.1	2.01	
14.5	16 14.5	59 29.8	+0.03	u. 20 39.9	2.30	15 49.6	57 58.9	1.07	u. 21 58.2	2.00	
15.0	16 14.4	59 29.3	-0.12	L. 9 7.3	2.26	15 45.9	57 45.4	1.14	L. 10 22.1	2.00	
15.5	16 13.6	59 26.8	0.30	u. 21 34.2	2.20	15 42.1	57 31.2	1.21	u. 22 46.1	2.00	
16.0	16 12.4	59 22.1	0.49	L. 10 0.3	2.15	15 38.1	57 16.4	1.27	L. 11 10.0	2.01	
16.5	16 10.6	59 15.1	0.68	u. 22 26.0	2.12	15 34.0	57 1.0	1.32	u. 23 34.2	2.02	
17.0	16 8.0	59 5.9	0.86	L. 10 51.3	2.10	15 29.5	56 45.0	1.35	L. 11 58.5	2.03	
17.5	16 4.6	58 54.4	1.05	u. 23 16.3	2.07	15 25.0	56 28.6	1.37			
18.0	16 0.9	58 40.7	1.23	L. 11 41.0	2.05	15 20.6	56 12.2	1.36	u. 0 23.0	2.05	
18.5	15 56.7	58 25.0	1.38			15 16.1	55 55.9	1.34	L. 12 47.7	2.07	
19.0	15 52.0	58 7.7	1.50	u. 0 5.5	2.03	15 11.9	55 39.9	1.30	u. 1 12.6	2.08	
19.5	15 47.0	57 48.9	1.61	L. 12 29.8	2.03	15 7.8	55 24.5	1.24	L. 13 37.6	2.08	
20.0	15 41.6	57 28.9	1.69	u. 0 54.2	2.03	15 3.8	55 10.0	1.16	u. 2 2.7	2.08	
20.5	15 36.0	57 8.3	1.73	L. 13 18.6	2.03	15 0.2	54 56.6	1.06	L. 14 27.8	2.08	
21.0	15 30.3	56 47.4	1.74	u. 1 43.0	2.03	14 56.9	54 44.5	0.94	u. 2 52.7	2.07	
21.5	15 24.6	56 26.5	1.72	L. 14 7.6	2.04	14 54.1	54 34.1	0.79	L. 15 17.5	2.05	
22.0	15 19.0	56 6.1	1.66	u. 2 32.2	2.05	14 51.8	54 25.5	0.63	u. 3 42.2	2.03	
22.5	15 13.7	55 46.6	1.57	L. 14 57.0	2.06	14 49.9	54 19.0	0.45	L. 16 6.5	2.01	
23.0	15 8.8	55 28.3	1.46	u. 3 21.8	2.07	14 48.7	54 14.6	0.27	u. 4 30.5	1.98	
23.5	15 4.2	55 11.5	1.32	L. 15 46.7	2.07	14 48.3	54 12.5	-0.07	L. 16 54.1	1.95	
24.0	15 0.1	54 56.5	1.17	u. 4 11.6	2.07	14 48.3	54 12.9	+0.14	u. 5 17.4	1.92	
24.5	14 56.6	54 43.5	0.99	L. 16 36.4	2.06	14 48.8	54 15.8	0.35	L. 17 40.3	1.90	
25.0	14 53.6	54 32.8	0.79	u. 5 1.1	2.05	14 50.5	54 21.3	0.57	u. 6 3.0	1.87	
25.5	14 51.4	54 24.5	0.59	L. 17 25.6	2.03	14 52.6	54 29.4	0.78	L. 18 25.3	1.85	
26.0	14 50.1	54 18.7	0.38	u. 5 50.0	2.01	14 55.6	54 40.1	0.99	u. 6 47.4	1.84	
26.5	14 49.1	54 15.4	-0.16	L. 18 13.9	1.19	14 59.1	54 53.1	1.19	L. 19 9.4	1.83	
27.0	14 48.7	54 14.8	+0.06	u. 6 37.6	1.97	15 3.4	55 8.5	1.38	u. 7 31.3	1.83	
27.5	14 49.0	54 16.8	0.27	L. 19 1.1	1.95	15 8.2	55 26.2	1.55	L. 19 53.2	1.84	
28.0	14 50.1	54 21.4	0.49	u. 7 24.4	1.92	15 13.5	55 45.8	1.70	u. 8 15.4	1.85	
28.5	14 52.0	54 28.5	0.69	L. 19 47.3	1.90	15 19.3	56 7.1	1.84	L. 20 37.7	1.88	
29.0	14 54.7	54 37.9	0.88	u. 8 9.9	1.88	15 25.6	56 30.0	1.95	u. 9 0.5	1.92	
29.5	14 57.8	54 49.6	1.07	L. 20 32.2	1.87	15 32.0	56 53.9	2.01	L. 21 23.6	1.95	
30.0	15 1.6	55 3.5	1.23	u. 8 54.6	1.86	15 38.6	57 18.3	2.04	u. 9 47.5	2.02	
30.5	15 6.0	55 19.1	1.36	L. 21 16.9	1.85	15 45.3	57 42.8	2.12	L. 22 12.2	2.08	
31.0	15 10.8	55 36.2	1.48	u. 9 39.1	1.86	15 51.9	58 6.9	1.98	u. 10 37.6	2.15	
31.5	15 15.9	55 54.6	+1.57	L. 22 1.6	1.87	15 58.2	58 30.1	+1.87	L. 23 3.9	2.23	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

MAY.						JUNE.					
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	
d				h m	m				h m	m	
1.0	15 51.9	58 6.9	+1.98	u. 10 37.6	2.15	16 32.1	60 34.5	+1.14			
1.5	15 58.2	58 30.1	1.87	L. 23 3.9	2.23	16 35.3	60 46.2	0.79	u. 12 12.5	2.60	
2.0	16 4.1	58 51.9	1.73	u. 11 31.1	2.31	16 37.2	60 53.5	0.42	L. 0 44.2	2.64	
2.5	16 9.5	59 11.6	1.54	L. 23 59.2	2.38	16 38.0	60 56.4	+0.07	u. 13 15.8	2.63	
3.0	16 14.2	59 23.0	1.33			16 37.7	60 55.1	-0.29	L. 1 47.2	2.59	
3.5	16 18.2	59 43.7	1.09	u. 12 28.2	2.45	16 36.1	60 49.5	0.63	u. 14 17.9	2.53	
4.0	16 21.4	59 55.4	0.84	L. 0 57.9	2.51	16 33.6	60 40.0	0.94	L. 2 47.9	2.46	
4.5	16 23.7	60 3.7	0.60	u. 13 28.3	2.55	16 30.0	60 27.0	1.22	u. 15 17.0	2.39	
5.0	16 25.1	60 8.8	0.28	L. 1 50.1	2.57	16 25.6	60 10.8	1.45	L. 3 45.1	2.31	
5.5	16 25.6	60 10.5	+0.01	u. 14 30.0	2.57	16 20.6	59 52.3	1.62	u. 16 12.3	2.23	
6.0	16 25.2	60 9.1	-0.24	L. 3 0.8	2.55	16 15.0	59 31.9	1.76	L. 4 38.7	2.17	
6.5	16 24.0	60 4.7	0.47	u. 15 31.1	2.51	16 9.1	59 10.1	1.85	u. 17 4.3	2.11	
7.0	16 22.1	59 57.8	0.67	L. 4 0.9	2.46	16 3.0	58 47.5	1.90	L. 5 29.2	2.05	
7.5	16 19.5	59 48.5	0.86	u. 16 30.0	2.39	15 56.7	58 24.6	1.91	u. 17 53.5	2.01	
8.0	16 16.4	59 37.1	1.01	L. 4 58.2	2.32	15 50.5	58 1.7	1.89	L. 6 17.5	1.99	
8.5	16 12.9	59 24.2	1.13	u. 17 25.6	2.25	15 44.4	57 30.2	1.85	u. 18 41.2	1.97	
9.0	16 9.0	59 9.9	1.22	L. 5 52.2	2.19	15 38.4	57 17.4	1.79	L. 7 4.7	1.96	
9.5	16 4.9	58 54.8	1.29	u. 18 18.0	2.12	15 32.7	56 56.4	1.71	u. 19 28.2	1.86	
10.0	16 0.6	58 39.0	1.33	L. 6 43.1	2.07	15 27.2	56 36.4	1.62	L. 7 51.7	1.76	
10.5	15 56.2	58 22.8	1.36	u. 19 7.7	2.03	15 22.1	56 17.5	1.53	u. 20 15.3	1.98	
11.0	15 51.7	58 6.4	1.37	L. 7 31.8	2.00	15 17.3	55 59.7	1.43	L. 8 39.1	1.99	
11.5	15 47.3	57 49.9	1.37	u. 19 55.6	1.98	15 12.8	55 43.3	1.33	u. 21 3.1	2.01	
12.0	15 42.8	57 33.5	1.36	L. 8 19.2	1.96	15 8.6	55 27.9	1.23	L. 9 27.4	2.03	
12.5	15 38.4	57 17.3	1.34	u. 20 42.7	1.96	15 4.8	55 13.9	1.12	u. 21 51.8	2.04	
13.0	15 34.1	57 1.3	1.32	L. 9 6.2	1.96	15 1.2	55 1.1	1.02	L. 10 16.4	2.06	
13.5	15 29.8	56 45.7	1.29	u. 21 23.8	1.98	14 58.1	54 49.3	0.93	u. 22 41.2	2.07	
14.0	15 25.5	56 30.2	1.27	L. 9 53.6	1.99	14 55.2	54 38.8	0.83	L. 11 6.0	2.07	
14.5	15 21.5	56 15.1	1.23	u. 22 17.5	2.01	14 52.7	54 29.5	0.73	u. 23 30.8	2.06	
15.0	15 17.5	56 0.6	1.20	L. 11 41.8	2.03	14 50.5	54 21.2	0.64	L. 11 55.5	2.05	
15.5	15 13.7	55 46.3	1.17	u. 23 6.2	2.04	14 48.6	54 14.1	0.54			
16.0	15 9.9	55 32.6	1.12	L. 11 33.8	2.06	14 47.0	54 8.3	0.43	u. 0 19.9	2.03	
16.5	15 6.3	55 19.5	1.07	u. 23 55.7	2.08	14 45.7	54 3.7	0.32	L. 12 44.1	2.00	
17.0	15 2.9	55 7.0	1.01			14 44.8	54 0.5	0.21	u. 1 8.0	1.97	
17.5	14 59.8	54 55.3	0.94	L. 12 20.6	2.08	14 44.3	53 58.6	-0.10	L. 13 31.4	1.94	
18.0	14 56.8	54 44.4	0.87	u. 0 45.6	2.08	14 44.2	53 58.2	+0.03	u. 1 54.5	1.90	
18.5	14 54.1	54 34.5	0.78	L. 13 10.6	2.08	14 44.5	53 50.4	0.17	L. 14 17.1	1.87	
19.0	14 51.6	54 25.7	0.68	u. 1 35.5	2.06	14 45.3	54 2.3	0.32	u. 2 39.4	1.84	
19.5	14 49.6	54 18.3	0.56	L. 14 0.0	2.04	14 46.6	54 7.1	0.48	L. 15 1.3	1.81	
20.0	14 48.1	54 12.3	0.43	u. 2 24.4	2.01	14 48.4	54 13.8	0.65	u. 3 22.9	1.79	
20.5	14 46.9	54 8.0	0.28	L. 14 48.3	1.98	14 50.8	54 22.6	0.82	L. 15 44.3	1.78	
21.0	14 46.2	54 5.6	-0.12	u. 3 11.9	1.95	14 53.7	54 33.4	1.00	u. 4 5.6	1.78	
21.5	14 46.0	54 5.0	+0.05	L. 15 35.1	1.92	14 57.3	54 46.5	1.18	L. 16 26.9	1.79	
22.0	14 46.4	54 6.7	0.22	u. 3 58.0	1.88	15 1.4	55 1.8	1.37	u. 4 48.2	1.79	
22.5	14 47.5	54 10.4	0.41	L. 16 20.2	1.85	15 6.2	55 19.3	1.55	L. 17 9.7	1.81	
23.0	14 49.2	54 16.6	0.62	u. 4 42.3	1.83	15 11.6	55 39.0	1.72	u. 5 31.5	1.83	
23.5	14 51.5	54 25.2	0.82	L. 17 4.1	1.81	15 17.6	56 0.7	1.89	L. 17 53.7	1.88	
24.0	14 54.5	54 36.2	1.02	u. 5 25.8	1.80	15 24.0	56 24.3	2.04	u. 6 16.5	1.94	
24.5	14 58.2	54 49.6	1.22	L. 17 47.3	1.79	15 30.9	56 49.7	2.18	L. 18 40.1	1.90	
25.0	15 2.5	55 5.5	1.42	u. 6 8.8	1.80	15 38.2	57 16.6	2.30	u. 7 4.3	2.06	
25.5	15 7.5	55 23.8	1.61	L. 18 30.5	1.82	15 45.9	57 44.8	2.37	L. 19 29.6	2.15	
26.0	15 13.1	55 44.2	1.79	u. 6 52.4	1.84	15 53.7	58 13.5	2.40	u. 7 55.9	2.24	
26.5	15 19.2	56 6.8	1.95	L. 19 14.7	1.88	16 1.6	58 42.4	2.39	L. 20 23.3	2.33	
27.0	15 25.8	56 31.1	2.09	u. 7 37.4	1.92	16 9.3	59 10.8	2.32	u. 8 51.8	2.42	
27.5	15 32.8	56 57.0	2.20	L. 20 0.8	1.98	16 16.7	59 38.1	2.20	L. 21 21.3	2.50	
28.0	15 40.2	57 24.0	2.28	u. 8 24.9	2.05	16 23.7	60 3.7	2.02	u. 9 51.8	2.57	
28.5	15 47.7	57 51.7	2.32	L. 20 49.9	2.13	16 30.0	60 26.6	1.78	L. 22 23.0	2.62	
29.0	15 55.3	58 19.6	2.30	u. 9 15.9	2.21	16 35.2	60 46.4	1.48	u. 10 54.7	2.65	
29.5	16 2.7	58 46.9	2.23	L. 21 42.9	2.30	16 39.6	61 2.1	1.14	L. 23 26.6	2.65	
30.0	16 9.9	59 13.1	2.11	u. 10 11.0	2.39	16 42.8	61 13.7	0.76	u. 11 58.4	2.63	
30.5	16 16.6	59 37.6	1.95	L. 22 40.1	2.47	16 44.5	61 20.4	+0.35			
31.0	16 22.7	59 59.8	1.72	u. 11 10.2	2.54	16 45.0	61 22.2	-0.06	L. 0 29.7	2.59	
31.5	16 27.8	60 18.9	+1.45	L. 23 41.0	2.60	16 44.2	61 19.0	-0.46	u. 13 0.5	2.53	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

JULY.						AUGUST.					
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	
d	^a	^b	^a	^b ^m	^m	^a	^b	^a	^b ^m	^m	
1.0	16' 45.0	61' 22.2	-0.06	L. 0 29.7	2.59	16' 27.3	60' 14.4	-1.90	L. 2 0.6	2.19	
1.5	16 44.2	61 19.0	0.46	U. 13 0.5	2.53	16 20.0	59 50.2	2.11	U. 14 26.5	2.14	
2.0	16 42.0	61 11.1	0.85	L. 1 30.4	2.46	16 12.8	59 23.7	2.26	L. 2 52.1	2.11	
2.5	16 38.6	60 58.5	1.22	U. 13 50.5	2.39	16 5.2	58 55.7	2.36	U. 15 17.2	2.08	
3.0	16 34.1	60 41.9	1.53	L. 2 27.6	2.31	15 57.3	58 26.9	2.40	L. 3 42.1	2.06	
3.5	16 28.6	60 21.8	1.79	U. 14 54.9	2.24	15 49.5	57 57.9	2.38	U. 16 6.8	2.05	
4.0	16 22.3	59 58.9	2.00	L. 3 21.3	2.18	15 41.7	57 29.5	2.23	L. 4 31.4	2.05	
4.5	16 15.5	59 33.9	2.15	U. 15 47.1	2.12	15 34.3	57 2.0	2.23	U. 16 56.0	2.05	
5.0	16 8.4	59 7.4	2.24	L. 4 12.1	2.07	15 27.1	56 35.6	2.11	L. 5 20.6	2.05	
5.5	16 1.1	58 40.2	2.28	U. 16 36.8	2.04	15 20.2	56 11.0	1.97	U. 17 45.3	2.06	
6.0	15 53.5	58 12.8	2.27	L. 5 1.1	2.02	15 14.0	55 48.3	1.81	L. 6 10.0	2.06	
6.5	15 46.1	57 45.7	2.23	U. 17 25.2	2.00	15 8.4	55 27.6	1.63	U. 18 34.7	2.07	
7.0	15 38.9	57 19.2	2.15	L. 5 49.1	1.99	15 3.4	55 9.1	1.45	L. 6 59.4	2.07	
7.5	15 32.1	56 54.1	2.04	U. 18 13.0	1.99	14 59.1	54 52.8	1.26	U. 19 24.2	2.06	
8.0	15 25.6	56 30.2	1.92	L. 6 36.9	2.00	14 55.2	54 38.6	1.08	L. 7 48.8	2.06	
8.5	15 19.5	56 7.9	1.79	U. 19 1.0	2.01	14 52.0	54 26.8	0.89	U. 20 13.3	2.04	
9.0	15 13.9	55 47.3	1.64	L. 7 25.1	2.02	14 49.3	54 17.2	0.71	L. 8 37.7	2.02	
9.5	15 8.8	55 28.5	1.49	U. 19 49.4	2.03	14 47.3	54 9.8	0.54	U. 21 1.9	1.99	
10.0	15 4.2	55 11.6	1.34	L. 8 13.8	2.04	14 45.8	54 4.4	0.37	L. 9 25.7	1.97	
10.5	15 0.0	54 56.4	1.19	U. 20 38.4	2.05	14 44.9	54 0.9	0.21	U. 21 49.3	1.95	
11.0	14 56.4	54 43.1	1.03	L. 9 3.1	2.06	14 44.5	53 59.2	-0.06	L. 10 12.5	1.92	
11.5	14 53.3	54 31.7	0.88	U. 21 27.7	2.05	14 44.5	53 59.2	+0.08	U. 22 35.4	1.89	
12.0	14 50.6	54 21.9	0.75	L. 9 52.3	2.05	14 45.0	54 0.9	0.20	L. 10 57.9	1.86	
12.5	14 48.4	54 13.8	0.61	U. 22 16.8	2.03	14 45.8	54 4.0	0.32	U. 23 20.1	1.83	
13.0	14 46.7	54 7.3	0.48	L. 10 41.0	2.01	14 47.0	54 8.5	0.43	L. 11 42.0	1.81	
13.5	14 45.3	54 2.4	0.35	U. 23 5.0	1.99	14 48.5	54 14.2	0.53			
14.0	14 44.4	53 58.9	0.23	L. 11 28.7	1.96	14 50.5	54 21.2	0.62	U. 0 3.7	1.80	
14.5	14 43.8	53 56.8	0.12	U. 23 52.1	1.93	14 52.6	54 29.3	0.72	L. 12 25.2	1.80	
15.0	14 43.6	53 56.0	-0.01			14 55.1	54 38.6	0.81	U. 0 46.6	1.79	
15.5	14 43.7	53 56.6	+0.10	L. 12 15.0	1.90	14 57.8	54 48.9	0.90	L. 13 8.2	1.79	
16.0	14 44.3	53 58.4	0.21	U. 0 37.6	1.87	15 1.0	55 0.2	0.99	U. 1 29.5	1.79	
16.5	14 45.1	54 1.7	0.33	L. 12 59.8	1.84	15 4.4	55 12.7	1.08	L. 13 50.9	1.81	
17.0	14 46.4	54 6.4	0.45	U. 1 21.7	1.81	15 8.1	55 26.3	1.17	U. 2 12.8	1.83	
17.5	14 48.1	54 12.4	0.57	L. 13 43.3	1.79	15 12.2	55 40.9	1.27	L. 14 35.0	1.86	
18.0	14 50.1	54 20.0	0.70	U. 2 4.6	1.78	15 16.5	55 56.7	1.36	U. 2 57.7	1.90	
18.5	14 52.6	54 29.1	0.83	L. 14 25.9	1.77	15 21.1	56 13.6	1.45	L. 15 20.9	1.95	
19.0	14 55.6	54 39.8	0.97	U. 2 47.1	1.77	15 25.9	56 31.5	1.53	U. 3 44.7	2.01	
19.5	14 58.9	54 52.3	1.11	L. 15 8.3	1.78	15 31.0	56 50.4	1.61	L. 16 9.2	2.07	
20.0	15 2.7	55 6.5	1.26	U. 3 29.7	1.79	15 36.4	57 10.3	1.69	U. 4 34.6	2.14	
20.5	15 7.1	55 22.5	1.41	L. 15 51.3	1.82	15 42.1	57 30.9	1.75	L. 17 0.7	2.21	
21.0	15 11.9	55 40.3	1.55	U. 4 13.4	1.86	15 47.9	57 52.3	1.80	U. 5 27.8	2.28	
21.5	15 17.2	55 59.7	1.70	L. 16 35.9	1.90	15 53.9	58 14.1	1.82	L. 17 55.6	2.35	
22.0	15 23.0	56 21.0	1.83	U. 4 59.0	1.96	15 59.9	58 36.2	1.83	U. 6 24.2	2.41	
22.5	15 29.2	56 43.7	1.95	L. 17 22.8	2.02	16 5.8	58 58.1	1.80	L. 18 53.5	2.46	
23.0	15 35.9	57 7.9	2.07	U. 5 47.5	2.10	16 11.6	59 19.4	1.73	U. 7 23.2	2.48	
23.5	15 42.7	57 33.4	2.16	L. 18 13.1	2.17	16 17.1	59 39.7	1.62	L. 19 53.3	2.48	
24.0	15 49.9	57 59.7	2.22	U. 6 39.6	2.26	16 22.2	59 58.4	1.47	U. 8 23.4	2.49	
24.5	15 57.3	58 26.7	2.24	L. 19 7.2	2.34	16 26.7	60 14.9	1.28	L. 20 53.4	2.48	
25.0	16 4.6	58 53.5	2.22	U. 7 35.8	2.42	16 30.5	60 28.9	1.04	U. 9 23.3	2.46	
25.5	16 11.8	59 20.1	2.16	L. 20 5.3	2.49	16 33.6	60 39.9	0.76	L. 21 52.7	2.43	
26.0	16 18.6	59 45.4	2.04	U. 8 35.6	2.55	16 35.5	60 47.2	0.44	U. 10 21.6	2.39	
26.5	16 25.2	60 9.1	1.87	L. 21 6.4	2.59	16 36.4	60 50.5	+0.10	L. 22 50.0	2.34	
27.0	16 31.0	60 30.4	1.65	U. 9 37.6	2.61	16 36.2	60 49.6	-0.24	U. 11 17.7	2.29	
27.5	16 35.9	60 48.6	1.37	L. 22 8.9	2.61	16 34.8	60 44.5	0.60	L. 23 45.0	2.24	
28.0	16 39.8	61 3.2	1.04	U. 10 40.0	2.58	16 32.3	60 35.2	0.95	U. 12 11.8	2.21	
28.5	16 42.7	61 13.5	0.67	L. 23 10.7	2.54	16 28.7	60 21.9	1.27			
29.0	16 44.2	61 19.2	+0.27	U. 11 40.9	2.48	16 24.0	60 4.9	1.52	L. 0 38.1	2.18	
29.5	16 44.4	61 20.1	-0.13			16 18.5	59 44.7	1.80	U. 13 4.1	2.16	
30.0	16 43.4	61 16.0	0.55	L. 0 10.3	2.42	16 12.2	59 21.8	2.00	L. 1 29.9	2.14	
30.5	16 40.9	61 6.9	0.94	U. 12 39.0	2.36	16 5.4	58 56.8	2.16	U. 13 55.4	2.13	
31.0	16 37.2	60 53.4	1.30	L. 1 6.9	2.29	15 58.3	58 30.3	2.26	L. 2 29.8	2.12	
31.5	16 32.4	60 35.7	-1.62	U. 13 34.0	2.24	15 50.8	58 3.1	-2.29	U. 14 46.1	2.11	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

SEPTEMBER.						OCTOBER.					
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	
d				h m	m				h m	m	
1.0	15 43.3	57 35.6	-2.28	z. 3 11.5	2.11	15 15.5	55 53.2	-1.75	L. 3 33.7	2.14	
1.5	15 36.0	57 8.5	2.23	u. 15 36.8	2.11	15 10.0	55 39.7	1.61	u. 15 59.3	2.11	
2.0	15 23.9	56 42.2	2.14	L. 4 2.1	2.11	15 5.0	55 14.4	1.45	L. 4 24.5	2.09	
2.5	15 22.0	56 17.2	2.02	u. 16 27.4	2.10	15 0.6	54 58.4	1.26	u. 16 49.6	2.07	
3.0	15 15.6	55 53.8	1.86	L. 4 52.7	2.10	14 56.8	54 44.6	1.06	L. 5 14.2	2.04	
3.5	15 9.8	55 32.4	1.69	u. 17 17.9	2.10	14 53.7	54 33.1	0.85	u. 17 38.4	2.00	
4.0	15 4.6	55 13.3	1.50	L. 5 43.0	2.09	14 51.3	54 24.1	0.65	L. 6 2.3	1.97	
4.5	15 0.0	54 56.4	1.30	u. 18 8.0	2.07	14 49.5	54 17.6	0.43	u. 18 25.7	1.93	
5.0	14 56.1	54 41.9	1.10	L. 6 32.7	2.05	14 48.4	54 13.8	0.21	L. 6 48.7	1.90	
5.5	14 52.8	54 29.9	0.89	u. 18 57.1	2.03	14 48.1	54 12.6	-0.00	u. 19 11.3	1.86	
6.0	14 50.2	54 20.4	0.68	L. 7 21.3	2.00	14 48.4	54 13.9	+0.22	L. 7 33.6	1.84	
6.5	14 48.3	54 13.4	0.48	u. 19 45.1	1.97	14 49.4	54 17.6	0.42	u. 19 55.6	1.82	
7.0	14 47.0	54 8.8	0.28	L. 8 8.5	1.94	14 51.1	54 23.7	0.61	L. 8 17.4	1.80	
7.5	14 46.4	54 6.5	-0.09	u. 20 31.5	1.91	14 53.2	54 32.0	0.78	u. 20 39.0	1.80	
8.0	14 46.3	54 6.4	+0.09	L. 8 54.3	1.88	14 56.2	54 42.3	0.94	L. 9 0.6	1.80	
8.5	14 46.9	54 8.3	0.26	u. 21 16.7	1.85	14 59.5	54 54.4	1.08	u. 21 22.2	1.80	
9.0	14 48.0	54 12.3	0.41	L. 9 38.9	1.83	15 3.2	55 8.0	1.19	L. 9 44.0	1.82	
9.5	14 49.6	54 18.2	0.55	u. 22 0.8	1.81	15 7.3	55 22.9	1.28	u. 22 5.9	1.84	
10.0	14 51.6	54 25.6	0.68	L. 10 22.4	1.81	15 11.6	55 38.9	1.36	L. 10 28.2	1.87	
10.5	14 54.1	54 34.4	0.79	u. 22 44.0	1.80	15 16.2	55 55.6	1.40	u. 22 50.9	1.90	
11.0	14 56.8	54 44.4	0.88	L. 11 5.6	1.80	15 20.8	56 12.6	1.43	L. 11 14.0	1.94	
11.5	14 59.8	54 55.6	0.96	u. 23 27.3	1.80	15 25.5	56 29.9	1.44	u. 23 37.7	1.99	
12.0	15 3.0	55 7.6	1.04	L. 11 49.0	1.81	15 30.1	56 47.0	1.42			
12.5	15 6.5	55 20.3	1.09			15 34.8	57 3.8	1.38	L. 12 2.1	2.05	
13.0	15 10.2	55 33.7	1.14	u. 0 11.1	1.84	15 39.2	57 20.1	1.32	u. 0 27.1	2.11	
13.5	15 14.0	55 47.6	1.18	L. 12 33.4	1.87	15 43.4	57 35.5	1.25	L. 12 52.9	2.17	
14.0	15 17.9	56 1.9	1.20	u. 0 56.1	1.90	15 47.4	57 50.1	1.16	u. 1 19.4	2.24	
14.5	15 21.8	56 16.6	1.22	L. 13 19.2	1.95	15 51.0	58 3.7	1.08	L. 13 46.6	2.30	
15.0	15 25.8	56 31.4	1.24	u. 1 43.0	2.00	15 54.4	58 16.1	0.99	u. 2 14.5	2.34	
15.5	15 30.0	56 46.3	1.26	L. 14 7.3	2.05	15 57.4	58 27.3	0.89	L. 14 42.9	2.38	
16.0	15 34.2	57 1.5	1.27	u. 2 32.3	2.11	16 0.1	58 37.3	0.79	u. 3 11.8	2.41	
16.5	15 33.3	57 16.8	1.28	L. 14 58.0	2.17	16 2.6	58 46.2	0.69	L. 15 40.8	2.42	
17.0	15 42.4	57 32.2	1.28	u. 3 24.4	2.23	16 4.7	58 54.0	0.60	u. 4 9.9	2.42	
17.5	15 46.6	57 47.6	1.28	L. 15 51.6	2.29	16 6.5	59 0.6	0.51	L. 16 39.0	2.40	
18.0	15 50.8	58 2.9	1.27	u. 4 19.4	2.34	16 8.0	59 6.1	0.42	u. 5 7.7	2.38	
18.5	15 54.9	58 18.2	1.26	L. 16 47.7	2.38	16 9.2	59 10.6	0.33	L. 17 36.1	2.35	
19.0	15 59.0	58 33.2	1.23	u. 5 16.4	2.41	16 10.1	59 13.9	0.24	u. 6 4.1	2.31	
19.5	16 2.9	58 47.8	1.19	L. 17 45.5	2.41	16 10.7	59 16.1	0.14	L. 18 31.5	2.27	
20.0	16 6.8	59 1.8	1.14	u. 6 14.6	2.41	16 11.0	59 17.2	+0.03	u. 6 58.5	2.22	
20.5	16 10.4	59 15.1	1.07	L. 18 43.7	2.41	16 11.0	59 17.1	-0.07	L. 19 24.8	2.18	
21.0	16 13.8	59 27.3	0.97	u. 7 12.7	2.40	16 10.6	59 15.6	0.19	u. 7 50.9	2.15	
21.5	16 16.7	59 38.1	0.84	L. 19 44.3	2.37	16 9.8	59 12.6	0.31	L. 20 16.6	2.12	
22.0	16 19.2	59 47.3	0.68	u. 8 9.5	2.33	16 8.5	59 8.1	0.44	u. 8 41.9	2.11	
22.5	16 21.2	59 54.5	0.50	L. 20 37.4	2.30	16 6.8	59 2.0	0.58	L. 21 7.0	2.10	
23.0	16 22.5	59 59.3	0.30	u. 9 4.7	2.26	16 4.7	58 54.2	0.72	u. 9 32.1	2.09	
23.5	16 23.1	60 1.5	+0.06	L. 21 31.7	2.23	16 2.1	58 44.6	0.87	L. 21 57.2	2.09	
24.0	16 22.9	60 0.9	-0.19	u. 9 58.3	2.20	15 59.0	58 33.2	1.01	u. 10 22.5	2.09	
24.5	16 22.0	59 57.2	0.43	L. 22 24.5	2.17	15 55.5	58 20.2	1.15	L. 22 47.8	2.10	
25.0	16 21.1	59 50.4	0.69	u. 10 50.5	2.16	15 51.5	58 5.7	1.27	u. 11 13.1	2.12	
25.5	16 17.4	59 40.6	0.95	L. 23 16.4	2.15	15 47.2	57 49.7	1.38	L. 23 38.6	2.13	
26.0	16 13.9	59 27.8	1.19	u. 11 42.0	2.14	15 42.5	57 32.4	1.47			
26.5	16 9.7	59 12.2	1.41			15 37.6	57 14.2	1.54	u. 12 4.4	2.15	
27.0	16 4.8	58 54.1	1.60	L. 0 7.6	2.14	15 32.5	56 55.4	1.58	L. 0 30.3	2.16	
27.5	15 59.3	58 33.9	1.75	u. 12 33.2	2.14	15 27.3	56 36.3	1.60	u. 12 56.2	2.17	
28.0	15 53.3	58 12.1	1.87	L. 0 58.9	2.14	15 22.1	56 17.2	1.58	L. 1 22.2	2.17	
28.5	15 47.0	57 49.0	1.95	u. 13 24.6	2.15	15 16.9	55 58.4	1.54	u. 13 48.2	2.17	
29.0	15 40.6	57 25.4	1.97	L. 1 50.4	2.15	15 11.9	55 40.2	1.48	L. 2 14.0	2.15	
29.5	15 34.1	57 1.6	1.98	u. 14 16.3	2.15	15 7.2	55 23.0	1.38	u. 14 39.7	2.12	
30.0	15 27.7	56 37.9	1.94	L. 2 42.1	2.15	15 2.9	55 7.1	1.25	L. 3 5.0	2.09	
30.5	15 21.4	56 15.0	1.86	u. 15 7.9	2.15	14 59.1	54 52.9	1.11	u. 15 29.8	2.06	
31.0	15 15.5	55 53.2	1.75	L. 3 33.7	2.14	14 55.7	54 40.6	0.95	L. 3 54.3	2.02	
31.5	15 10.0	55 32.7	-1.62	u. 15 59.3	2.11	14 52.9	54 30.3	-0.76	u. 16 18.3	1.98	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

NOVEMBER.						DECEMBER.					
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	
d				h m	m				h m	m	
1.0	14 50.7	54 22.4	—0.56	L. 4 41.7	1.94	14 47.6	54 11.0	+0.33	L. 4 48.9	1.78	
1.5	14 49.2	54 16.9	0.35	U. 17 4.7	1.90	14 49.1	54 16.2	0.55	U. 17 10.0	1.77	
2.0	14 48.4	54 13.8	—0.15	L. 5 27.2	1.86	14 51.2	54 24.2	0.77	L. 5 31.1	1.76	
2.5	14 48.3	54 13.4	+0.07	U. 17 49.4	1.83	14 54.1	54 34.7	0.98	U. 17 52.2	1.76	
3.0	14 48.9	54 15.7	0.30	L. 6 11.2	1.81	14 57.7	54 47.7	1.19	L. 6 13.4	1.77	
3.5	14 50.2	54 21.5	0.51	U. 18 32.8	1.79	15 1.9	55 3.3	1.40	U. 18 34.8	1.80	
4.0	14 52.2	54 27.9	0.72	L. 6 54.3	1.79	15 6.8	55 21.3	1.59	L. 6 56.6	1.83	
4.5	14 54.9	54 38.0	0.94	U. 19 15.6	1.79	15 12.3	55 41.6	1.77	U. 19 18.8	1.87	
5.0	14 58.3	54 50.6	1.13	L. 7 37.1	1.79	15 18.4	56 3.8	1.93	L. 7 41.6	1.93	
5.5	15 2.4	55 5.0	1.31	U. 19 58.6	1.81	15 24.9	56 27.8	2.05	U. 20 5.0	1.99	
6.0	15 6.9	55 21.7	1.46	L. 8 20.5	1.83	15 31.8	56 53.1	2.15	L. 8 29.3	2.06	
6.5	15 11.9	55 40.1	1.67	U. 20 42.7	1.87	15 39.0	57 19.4	2.21	U. 20 54.5	2.14	
7.0	15 17.3	56 0.0	1.71	L. 9 5.3	1.91	15 46.3	57 46.1	2.22	L. 9 20.7	2.22	
7.5	15 23.1	56 21.0	1.89	U. 21 28.4	1.95	15 53.5	58 12.7	2.19	U. 21 47.8	2.30	
8.0	15 29.1	56 42.9	1.83	L. 9 52.3	2.01	16 0.5	58 38.6	2.10	L. 10 15.9	2.38	
8.5	15 35.1	57 5.0	1.84	U. 22 17.0	2.08	16 7.2	59 3.1	1.97	U. 22 44.9	2.45	
9.0	15 41.0	57 27.0	1.81	L. 10 42.4	2.15	16 13.4	59 25.8	1.79	L. 11 14.8	2.51	
9.5	15 46.8	57 48.4	1.75	U. 23 8.7	2.23	16 18.9	59 46.0	1.56	U. 23 45.2	2.55	
10.0	15 52.4	58 8.8	1.65	L. 11 35.9	2.30	16 23.6	60 3.2	1.28			
10.5	15 57.5	58 27.8	1.52			16 27.3	60 16.9	0.98	L. 12 15.9	2.57	
11.0	16 2.3	58 45.1	1.36	U. 0 3.9	2.37	16 30.0	60 26.8	0.67	U. 0 46.8	2.57	
11.5	16 6.4	59 0.3	1.17	L. 12 32.7	2.43	16 31.6	60 32.9	0.34	L. 13 17.5	2.54	
12.0	16 9.9	59 13.2	0.96	U. 1 2.0	2.47	16 32.2	60 34.9	+0.01	U. 1 47.9	2.50	
12.5	16 12.7	59 23.6	0.76	L. 13 31.8	2.49	16 31.7	60 33.1	—0.30	L. 14 17.6	2.45	
13.0	16 14.8	59 31.3	0.54	U. 2 1.6	2.50	16 30.2	60 27.6	0.60	U. 2 46.7	2.39	
13.5	16 16.2	59 36.5	0.33	L. 14 31.5	2.49	16 27.8	60 18.8	0.86	L. 15 14.9	2.32	
14.0	16 17.0	59 39.1	+0.12	U. 3 1.4	2.47	16 24.6	60 7.1	1.08	U. 3 42.4	2.26	
14.5	16 17.1	59 39.4	—0.06	L. 15 30.7	2.42	16 20.7	59 52.8	1.27	L. 16 9.2	2.20	
15.0	16 16.6	59 37.5	0.24	U. 3 59.4	2.37	16 16.3	59 36.5	1.42	U. 4 35.3	2.15	
15.5	16 15.5	59 33.6	0.40	L. 16 27.5	2.32	16 11.5	59 18.8	1.52	L. 17 0.8	2.11	
16.0	16 14.0	59 28.0	0.53	U. 4 54.9	2.26	16 6.4	59 0.0	1.59	U. 5 25.9	2.08	
16.5	16 12.0	59 20.9	0.64	L. 17 21.8	2.20	16 1.1	58 40.7	1.62	L. 17 50.7	2.05	
17.0	16 9.8	59 12.6	0.73	U. 5 47.9	2.15	15 55.7	58 21.1	1.63	U. 6 15.2	2.04	
17.5	16 7.3	59 3.3	0.81	L. 18 13.5	2.11	15 50.4	58 1.6	1.61	L. 18 39.6	2.03	
18.0	16 4.5	58 53.2	0.88	U. 6 39.5	2.08	15 45.2	57 42.3	1.58	U. 7 4.0	2.03	
18.5	16 1.5	58 42.3	0.94	L. 19 3.5	2.05	15 40.1	57 23.6	1.54	L. 19 28.4	2.04	
19.0	15 58.3	58 30.7	0.98	U. 7 23.1	2.04	15 35.2	57 5.5	1.48	U. 7 53.0	2.05	
19.5	15 55.1	58 18.7	1.02	L. 19 52.6	2.04	15 30.4	56 48.0	1.43	L. 20 17.7	2.07	
20.0	15 51.7	58 6.2	1.06	U. 8 17.1	2.04	15 25.8	56 31.2	1.36	U. 8 42.7	2.09	
20.5	15 48.2	57 53.3	1.10	L. 20 41.6	2.05	15 21.5	56 15.2	1.30	L. 21 7.8	2.10	
21.0	15 44.5	57 39.9	1.13	U. 9 6.3	2.06	15 17.3	56 0.0	1.24	U. 9 33.1	2.11	
21.5	15 40.8	57 26.1	1.16	L. 21 31.2	2.07	15 13.4	55 45.4	1.17	L. 21 58.5	2.12	
22.0	15 36.9	57 12.0	1.19	U. 9 56.1	2.09	15 9.7	55 31.8	1.11	U. 10 24.0	2.12	
22.5	15 33.0	56 57.6	1.22	L. 22 21.5	2.11	15 6.1	55 18.8	1.05	L. 22 49.4	2.11	
23.0	15 29.0	56 42.9	1.24	U. 10 47.1	2.14	15 2.8	55 6.6	0.98	U. 11 14.7	2.10	
23.5	15 25.0	56 27.9	1.25	L. 23 12.8	2.14	14 59.7	54 55.2	0.91	L. 23 39.7	2.07	
24.0	15 21.8	56 12.9	1.25	U. 11 38.6	2.15	14 56.8	54 44.6	0.84			
24.5	15 16.7	55 57.8	1.25			14 54.2	54 34.9	0.76	U. 12 4.4	2.04	
25.0	15 12.7	55 43.0	1.22	L. 0 4.4	2.15	14 51.8	54 26.3	0.68	L. 0 28.8	2.01	
25.5	15 8.7	55 28.5	1.18	U. 12 30.2	2.15	14 49.7	54 18.6	0.59	U. 12 52.7	1.97	
26.0	15 4.9	55 14.5	1.13	L. 0 55.8	2.12	14 48.0	54 12.1	0.49	L. 1 16.1	1.93	
26.5	15 1.3	55 1.2	1.07	U. 13 21.1	2.09	14 46.6	54 6.9	0.37	U. 13 39.1	1.89	
27.0	14 58.0	54 49.0	0.98	L. 1 46.0	2.06	14 45.5	54 3.1	0.25	L. 2 1.6	1.86	
27.5	14 55.0	54 37.9	0.87	U. 14 10.5	2.02	14 44.9	54 0.9	—0.11	U. 14 23.6	1.82	
28.0	14 52.4	54 28.3	0.75	L. 2 34.5	1.98	14 44.8	54 0.4	+0.04	L. 2 45.3	1.79	
28.5	14 50.2	54 20.3	0.59	U. 14 58.1	1.93	14 45.2	54 1.8	0.20	U. 15 6.6	1.77	
29.0	14 48.5	54 14.1	0.43	L. 3 21.1	1.89	14 46.1	54 5.2	0.37	L. 3 27.7	1.75	
29.5	14 47.4	54 9.9	0.26	U. 15 43.6	1.86	14 47.6	54 10.7	0.55	U. 15 48.7	1.74	
30.0	14 46.8	54 7.9	—0.07	L. 4 5.7	1.83	14 49.7	54 18.4	0.74	L. 4 9.6	1.74	
30.5	14 46.9	54 8.2	+0.13	U. 16 27.3	1.80	14 52.4	54 28.5	0.94	U. 16 30.5	1.75	
31.0	14 47.6	54 11.0	0.33	L. 4 48.9	1.78	14 55.8	54 40.9	1.14	L. 4 51.6	1.77	
31.5	14 49.1	54 16.2	+0.55	U. 17 10.0	1.77	14 59.9	54 55.8	+1.34	U. 17 12.9	1.80	

WASHINGTON MEAN TIME.

PHASES.

Month.	Full Moon.	Last Quarter.	New Moon.	First Quarter.	Full Moon.
	d h m	d h m	d h m	d h m	d h m
January	4 10 24.0	12 6 58.6	18 22 53.9	25 23 45.5	
February	3 5 16.9	10 17 38.5	17 9 58.4	24 19 25.9	
March	4 21 37.8	12 1 47.7	18 21 29.1	26 15 49.4	
April	3 11 0.8	10 8 14.9	17 9 57.1	25 10 59.5	
May	2 21 43.6	9 14 7.7	16 23 40.2	25 3 38.7	
June	1 6 21.6	7 20 44.3	15 14 27.9	23 17 23.0	30 13 37.8
July		7 5 20.8	15 5 45.1	23 4 24.2	29 20 25.6
August		5 16 57.4	13 20 54.7	21 13 11.4	28 3 46.5
September		4 8 1.4	12 11 33.6	19 20 24.9	26 12 53.7
October		4 2 13.3	12 1 33.8	19 2 57.7	26 0 47.3
November		2 22 25.8	10 14 50.9	17 9 57.0	24 15 53.1
December		2 19 5.9	10 3 15.3	16 18 37.5	24 9 42.1

APOGEE, PERIGEE, AND GREATEST LIBRATION.

Month.	Apogee.	Perigee.	Apogee.	GREATEST LIBRATION.			
	d h	d h	d h		d h m	d h m	
January	2 21.0	17 23.0	30 6.4		11 14 7 s.e.	23 19 8 s.w.	
February		15 6.3	27 0.7		8 2 54 s.e.	20 23 9 s.w.	
March		14 14.8	26 20.9		6 8 55 s.e.	20 17 5 s.w.	
April		8 12.2	23 16.1	2 2 44 s.e.	16 15 20 s.w.	29 17 24 s.e.	
May		5 12.7	21 8.9		12 22 24 s.w.	27 17 49 s.e.	
June		2 14.2	17 20.7		9 3 43 s.w.	24 22 11 s.e.	
June		30 22.4					
July	15 0.9	29 8.1			7 2 58 s.w.	23 2 20 s.e.	
August	11 5.3	26 15.9		4 7 26 s.w.	20 0 3 s.e.		
September	7 18.4	23 15.4		1 11 36 s.w.	16 1 1 s.e.	29 10 59 s.w.	
October	5 11.8	20 4.4			12 6 31 s.e.	26 22 53 s.w.	
November	2 7.9	14 7.5	30 4.6		8 9 41 s.e.	22 11 6 s.w.	
December		12 0.4	27 21.3		6 6 36 s.e.	18 21 46 s.w.	

MOON'S EQUATOR.

The moon's libration in latitude and longitude, at any time, may be found by means of the following formulas and tables.

I = the inclination of the moon's equator $1^{\circ} 28'.8$,

Ω = mean longitude of moon's ascending node (see page 250),

C = the angle which the mean meridian of the moon's disc makes with the circle of declination reckoned from north to west on the apparent disc.

λ , β , a' , and δ' the apparent longitude, latitude, right ascension, and declination of the moon affected with parallax.

$$\Delta \lambda = C'.57 \sin 2(\lambda - \Omega),$$

$$a = \cos(\Omega - \lambda) \sin I,$$

$$\tan \beta = \sin(\Omega - \lambda) \tan I.$$

In these formulas, the tables p. 8 of the Appendix may be substituted.

The libration in latitude $= b = B - \beta$.

The libration in longitude $= l = \lambda + \Delta \lambda + ab - C$.

$$\sin C = \sin i \frac{\cos(C + l - \Omega + \Delta)}{\cos \delta'} = - \sin i \frac{\cos(a' - \Omega')}{\cos b}$$

WASHINGTON MEAN TIME.

MOON'S EQUATOR.

Sidereal Date On.	i Inclination to the Earth's Equator.	Δ Ascending Node on Earth's Equator to Ascending Node on Ecliptic.	Ω' Ascending Node on Earth's equator.	ζ Moon's Mean Longitude.
^d 0	23° 53.2	71° 33.8	3° 31.6	50° 21.4
10	23 54.0	71 2.7	3 30.9	181 45.7
20	23 54.7	70 31.6	3 30.2	313 9.9
30	23 55.5	70 0.5	3 29.6	84 34.2
40	23 56.2	69 29.5	3 28.9	215 58.4
50	23 57.0	68 58.5	3 28.2	347 22.7
60	23 57.8	68 27.5	3 27.4	118 46.9
70	23 58.5	67 56.5	3 26.7	250 11.2
80	23 59.3	67 25.5	3 25.9	21 35.4
90	24 0.0	66 54.6	3 25.2	152 59.7
100	24 0.8	66 23.6	3 24.4	284 24.0
110	24 1.6	65 52.7	3 23.6	55 48.2
120	24 2.3	65 21.7	3 22.7	187 12.5
130	24 3.1	64 50.8	3 21.9	318 36.7
140	24 3.8	64 19.9	3 21.0	90 1.0
150	24 4.6	63 49.0	3 20.2	221 25.2
160	24 5.3	63 18.1	3 19.3	352 49.5
170	24 6.0	62 47.2	3 18.4	124 13.7
180	24 6.8	62 16.4	3 17.5	255 38.0
190	24 7.5	61 45.5	3 16.5	27 2.2
200	24 8.2	61 14.7	3 15.6	158 26.5
210	24 8.9	60 43.9	3 14.6	289 50.7
220	24 9.6	60 13.0	3 13.6	61 15.0
230	24 10.4	59 42.2	3 12.6	192 39.2
240	24 11.1	59 11.4	3 11.5	324 3.5
250	24 11.8	58 40.6	3 10.5	95 27.7
260	24 12.5	58 9.9	3 9.4	226 52.0
270	24 13.2	57 39.1	3 8.3	358 16.2
280	24 13.9	57 8.4	3 7.2	129 40.5
290	24 14.6	56 37.7	3 6.1	261 4.7
300	24 15.3	56 7.0	3 5.0	32 27.0
310	24 16.0	55 36.4	3 3.8	163 53.3
320	24 16.6	55 5.7	3 2.7	295 17.5
330	24 17.3	54 35.0	3 1.5	66 41.8
340	24 17.9	54 4.3	3 0.3	198 6.0
350	24 18.6	53 33.7	2 59.1	329 30.2
360	24 19.2	53 3.1	2 57.8	100 54.5
370	24 19.8	52 32.4	2 56.6	232 18.7

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.				Apparent Declination.				Log Coefficient of t.		Log Coefficient of t ² .		Mean Solar Time of Meridian Transit.	Sidereal Date of Transit.
	At Mean Noon.		At Transit.		At Mean Noon.		At Transit.		In R.A.	In Dec.	In R.A.	In Dec.		
Jan. 1	19 13 29.33	13 38.30	24 28' 34.6"	28' 21.1"	+9.47363	+9.6510	-2.46	+5.35	1 0 30.1	0	1 0 30.1	0	1 0 30.1	0
2	19 20 37.80	20 47.71	24 17 3.0	16 45.9	9.47339	9.7101	2.94	5.36	2 0 33.3	1	2 0 33.3	1	2 0 33.3	1
3	19 27 45.91	27 56.76	24 3 57.0	3 35.9	9.47289	9.7624	3.17	5.36	3 0 36.5	2	3 0 36.5	2	3 0 36.5	2
4	19 34 53.39	35 5.17	23 49 16.2	48 50.6	9.47212	9.8093	3.35	5.36	4 0 39.7	3	4 0 39.7	3	4 0 39.7	3
5	19 41 59.94	42 12.63	23 33 0.3	32 29.8	9.47101	9.8517	3.48	5.36	5 0 42.9	4	5 0 42.9	4	5 0 42.9	4
6	19 49 5.23	49 18.81	23 15 9.3	14 33.5	9.46955	9.8903	3.59	5.36	6 0 46.0	5	6 0 46.0	5	6 0 46.0	5
7	19 56 8.92	56 23.36	22 55 43.3	55 1.8	9.46770	9.9256	3.68	5.36	7 0 49.2	6	7 0 49.2	6	7 0 49.2	6
8	20 3 10.60	3 25.86	22 34 42.7	33 55.2	9.46539	9.9581	3.78	5.35	8 0 52.3	7	8 0 52.3	7	8 0 52.3	7
9	20 10 9.80	10 25.85	22 12 8.4	11 14.5	9.46258	9.9880	3.85	5.35	9 0 55.3	8	9 0 55.3	8	9 0 55.3	8
10	20 17 6.03	17 22.82	21 48 1.6	47 1.1	9.45918	0.0155	3.93	5.34	10 0 58.3	9	10 0 58.3	9	10 0 58.3	9
11	20 23 58.70	24 16.18	21 22 24.0	21 16.6	9.45511	0.0409	4.01	5.33	11 1 1.3	10	11 1 1.3	10	11 1 1.3	10
12	20 30 47.16	31 5.25	20 55 17.8	54 3.3	9.45026	0.0643	4.07	5.32	12 1 4.1	11	12 1 4.1	11	12 1 4.1	11
13	20 37 30.69	37 49.30	20 26 45.9	25 24.3	9.44451	0.0856	4.14	5.30	13 1 6.9	12	13 1 6.9	12	13 1 6.9	12
14	20 44 8.44	44 27.49	19 56 52.0	55 23.3	9.43770	0.1049	4.21	5.27	14 1 9.6	13	14 1 9.6	13	14 1 9.6	13
15	20 50 39.45	50 58.85	19 25 40.6	24 4.9	9.42964	0.1223	4.27	5.24	15 1 12.2	14	15 1 12.2	14	15 1 12.2	14
16	20 57 2.64	57 22.27	18 53 17.4	51 34.8	9.42010	0.1376	4.34	5.20	16 1 14.6	15	16 1 14.6	15	16 1 14.6	15
17	21 3 16.79	3 36.50	18 19 49.1	18 0.1	9.40884	0.1508	4.40	5.14	17 1 16.9	16	17 1 16.9	16	17 1 16.9	16
18	21 9 20.51	9 40.14	17 45 23.9	43 29.1	9.39548	0.1618	4.45	5.06	18 1 19.0	17	18 1 19.0	17	18 1 19.0	17
19	21 15 12.24	15 31.62	17 10 11.5	8 11.6	9.37962	0.1705	4.51	4.94	19 1 20.9	18	19 1 20.9	18	19 1 20.9	18
20	21 20 50.24	21 9.17	16 34 23.4	32 19.3	9.36072	0.1764	4.57	4.74	20 1 22.6	19	20 1 22.6	19	20 1 22.6	19
21	21 26 12.52	26 30.79	15 58 12.8	56 5.8	9.33813	0.1794	4.63	+4.17	21 1 24.0	20	21 1 24.0	20	21 1 24.0	20
22	21 31 16.95	31 34.33	15 21 55.1	19 46.5	9.31101	0.1792	4.69	-4.38	22 1 25.1	21	22 1 25.1	21	22 1 25.1	21
23	21 36 1.18	36 17.44	14 45 47.5	43 38.9	9.27820	0.1753	4.74	4.85	23 1 25.9	22	23 1 25.9	22	23 1 25.9	22
24	21 40 22.67	40 37.56	14 10 9.5	8 2.8	9.23817	0.1672	4.79	5.09	24 1 26.3	23	24 1 26.3	23	24 1 26.3	23
25	21 44 18.73	44 32.00	13 35 22.8	33 20.0	9.18875	0.1541	4.83	5.25	25 1 26.2	24	25 1 26.2	24	25 1 26.2	24
26	21 47 46.59	47 58.01	12 61 50.9	59 54.1	9.12671	0.1352	4.87	5.38	26 1 25.7	25	26 1 25.7	25	26 1 25.7	25
27	21 50 43.41	50 52.78	12 29 58.7	28 9.9	9.04676	0.1096	4.90	5.48	27 1 24.7	26	27 1 24.7	26	27 1 24.7	26
28	21 53 6.43	53 13.60	11 60 12.4	58 33.7	8.93938	0.0757	4.93	5.56	28 1 23.1	27	28 1 23.1	27	28 1 23.1	27
29	21 54 53.07	54 57.94	11 32 58.8	31 32.0	8.78439	0.0315	4.95	5.63	29 1 20.9	28	29 1 20.9	28	29 1 20.9	28
30	21 56 1.04	56 3.59	11 8 44.1	7 30.8	8.52279	0.9741	4.98	5.69	30 1 18.1	29	30 1 18.1	29	30 1 18.1	29
Feb. 1	21 56 28.55	56 28.84	10 47 53.3	46 54.5	+7.67986	9.8990	5.00	5.74	31 1 14.6	30	31 1 14.6	30	31 1 14.6	30
2	21 56 14.43	56 12.66	10 30 48.9	30 5.0	-8.38719	9.7981	5.01	5.77	1 1 10.4	31	1 1 10.4	31	1 1 10.4	31
3	21 55 18.35	55 14.81	10 17 49.6	17 20.3	8.72785	9.6555	4.99	5.79	2 1 5.5	32	2 1 5.5	32	2 1 5.5	32
4	21 53 40.94	53 36.01	10 9 9.5	8 53.6	8.91201	9.4298	4.97	5.81	3 0 59.9	33	3 0 59.9	33	3 0 59.9	33
5	21 51 23.96	51 18.12	10 4 56.2	4 51.9	9.03438	+8.9172	4.94	5.81	4 0 53.7	34	4 0 53.7	34	4 0 53.7	34
6	21 48 30.41	48 24.19	10 5 10.2	5 15.1	9.12158	-9.0057	4.89	5.80	5 0 46.9	35	5 0 46.9	35	5 0 46.9	35
7	21 45 4.47	44 58.41	10 9 44.3	9 55.4	9.18492	9.4435	4.82	5.77	6 0 39.5	36	6 0 39.5	36	6 0 39.5	36
8	21 41 11.44	41 6.04	10 18 23.6	18 37.7	9.23002	9.6444	4.70	5.73	7 0 31.7	37	7 0 31.7	37	7 0 31.7	37
9	21 36 57.56	36 53.26	10 30 45.6	30 59.5	9.25995	9.7680	4.53	5.67	8 0 23.6	38	8 0 23.6	38	8 0 23.6	38
10	21 32 29.79	32 26.91	10 46 21.6	46 32.4	9.27667	9.8511	-4.20	5.59	9 0 15.2	39	9 0 15.2	39	9 0 15.2	39
11	21 27 55.42	27 54.13	11 4 38.1	4 43.6	9.28134	9.9079	+3.20	5.48	10 0 6.8	40	10 0 6.8	40	10 0 6.8	40
12	21 23 21.63	23 22.01	11 24 59.0	24 57.5	9.27472	9.9457	4.26	5.32	10 23 58.3	41	10 23 58.3	41	10 23 58.3	41
13	21 18 55.48	18 57.29	11 46 47.6	46 38.3	9.25714	9.9689	4.52	5.10	11 23 50.0	42	11 23 50.0	42	11 23 50.0	42
14	21 14 43.00	14 46.07	12 9 23.4	9 11.1	9.22861	9.9802	4.66	-4.67	12 23 41.9	43	12 23 41.9	43	12 23 41.9	43
15	21 10 49.56	10 53.57	12 32 23.7	32 3.9	9.18877	9.9815	4.75	+4.37	13 23 34.1	44	13 23 34.1	44	13 23 34.1	44
16	21 7 19.45	7 24.03	12 55 19.5	54 48.1	9.13677	9.9743	4.81	4.92	14 23 26.7	45	14 23 26.7	45	14 23 26.7	45
17	21 4 15.87	4 21.63	13 17 36.2	16 59.5	9.07088	9.9507	4.84	5.12	15 23 19.7	46	15 23 19.7	46	15 23 19.7	46
18	21 1 40.99	1 45.56	13 38 58.5	38 17.9	8.98789	9.9384	4.86	5.23	16 23 13.2	47	16 23 13.2	47	16 23 13.2	47
19	20 59 36.09	59 40.13	13 59 10.3	58 27.2	8.88177	9.9108	4.87	5.30	17 23 7.1	48	17 23 7.1	48	17 23 7.1	48
20	20 58 1.67	58 4.90	14 17 59.7	17 15.6	8.74031	9.8771	4.86	5.34	18 23 1.6	49	18 23 1.6	49	18 23 1.6	49
21	20 56 57.56	56 59.75	14 35 17.7	34 34.0	8.53316	9.8373	4.85	5.37	19 22 56.6	50	19 22 56.6	50	19 22 56.6	50
22	20 56 23.07	56 24.04	14 50 58.0	50 15.9	-8.14245	9.7911	4.84	5.39	20 22 52.1	51	20 22 52.1	51	20 22 52.1	51
23	20 56 17.18	56 16.80	15 4 56.6	4 17.2	+7.74364	9.7376	4.82	5.40	21 22 48.0	52	21 22 48.0	52	21 22 48.0	52
24	20 56 38.56	56 36.78	15 17 11.0	16 35.1	8.38009	9.6754	4.80	5.41	22 22 44.4	53	22 22 44.4	53	22 22 44.4	53
25	20 57 25.77	57 22.55	15 27 39.9	27 8.2	8.61689	9.6021	4.77	5.41	23 22 41.3	54	23 22 41.3	54	23 22 41.3	54
26	20 58 37.24	58 32.57	15 36 23.0	35 56.2	8.76108	9.5141	4.74	5.40	24 22 38.5	55	24 22 38.5	55	24 22 38.5	55
27	21 0 11.39	0 5.30	15 43 20.7	42 59.2	8.86272	9.4043	4.71	5.40	25 22 36.1	56	25 22 36.1	56	25 22 36.1	56
28	21 2 6.66	1 59.21	15 48 33.9	48 18.1	8.93971	9.2585	4.68	5.39	26 22 34.1	57	26 22 34.1	57	26 22 34.1	57
29	21 4 21.52	4 12.78	15 52 3.6	51 53.8	9.00053	9.0414	4.64	5.39	27 22 32.4	58	27 22 32.4	58	27 22 32.4	58
30	21 6 54.49	6 44.54	15 53 51.1	53 47.4	9.05007	-8.5967	4.61	5.38	28 22 31.0	59	28 22 31.0	59	28 22 31.0	59
31	21 9 44.22	9 33.12	15 53 58.0	54 0.5	9.09125	+8.4741	4.57	5.38	29 22 29.8	60	29 22 29.8	60	29 22 29.8	60
31	21 12 49.38	12 37.24	-15 52 25.8	52 34.5	+9.12606	+8.9918	+4.54	+5.37	30 22 28.9	61	30 22 28.9	61	30 22 28.9	61

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t.		Log Coefficient of t.		Mean Solar Time of Meridian Transit.	Sidereal Date of Transit.
	At Mean Noon.	At Transit.	At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.		
Mar. d	h m s	m s	° ' "	° ' "					d h m	d
1	21 6 54.49	6 44.54	15 53' 51.1"	53' 47.4"	+9.05007	-8.5067	+4.61	+5.38	0 22 31.0	59
2	21 9 44.22	9 33.12	15 53 58.0	54 0.5	9.09125	+8.4741	4.57	5.38	1 22 29.8	60
3	21 12 49.38	12 37.24	15 52 25.8	52 34.5	9.12605	8.9918	4.54	5.37	2 22 28.9	61
4	21 16 8.78	15 55.68	15 49 15.8	49 30.8	9.15581	9.2189	4.50	5.37	3 22 28.3	62
5	21 19 41.28	19 27.32	15 44 29.5	44 50.7	9.18154	9.3651	4.46	5.36	4 22 27.9	63
6	21 23 25.87	23 11.12	15 38 8.5	38 35.8	9.20397	9.4729	4.42	5.35	5 22 27.7	64
7	21 27 21.58	27 6.14	15 30 14.3	30 47.5	9.22365	9.5580	4.39	5.34	6 22 27.7	65
8	21 31 27.55	31 11.51	15 20 48.1	21 27.1	9.24103	9.6282	4.35	5.34	7 22 27.8	66
9	21 35 42.97	35 26.41	15 9 51.4	10 35.9	9.25647	9.6877	4.32	5.33	8 22 28.1	67
10	21 40 7.12	39 50.11	14 57 25.3	58 15.3	9.27029	9.7394	4.29	5.33	9 22 28.6	68
11	21 44 39.35	44 21.95	14 43 31.3	44 26.5	9.28267	9.7850	4.25	5.32	10 22 29.2	69
12	21 49 19.04	49 1.32	14 28 10.6	29 10.7	9.29383	9.8257	4.22	5.31	11 22 29.9	70
13	21 54 5.66	53 47.68	14 11 24.2	12 20.1	9.30395	9.8624	4.19	5.31	12 22 30.7	71
14	21 58 58.72	58 40.55	13 53 13.3	54 22.7	9.31317	9.8958	4.16	5.30	13 22 31.6	72
15	22 3 57.79	3 39.49	13 33 39.1	34 52.7	9.32160	9.9264	4.13	5.30	14 22 32.7	73
16	22 9 2.49	8 44.10	13 12 42.6	14 0.1	9.32933	9.9547	4.10	5.29	15 22 33.8	74
17	22 14 12.44	13 54.02	12 50 24.7	51 45.9	9.33648	9.9809	4.08	5.29	16 22 35.0	75
18	22 19 27.35	19 8.93	12 26 46.5	28 11.1	9.34313	0.0054	4.05	5.28	17 22 36.3	76
19	22 24 46.94	24 28.56	12 1 49.0	3 16.7	9.34933	0.0283	4.03	5.28	18 22 37.7	77
20	22 30 10.98	29 52.68	11 35 33.1	37 3.6	9.35517	0.0498	4.01	5.27	19 22 39.2	78
21	22 35 39.28	35 21.09	11 7 59.7	9 32.8	9.36068	0.0701	4.00	5.27	20 22 40.7	79
22	22 41 11.66	40 53.62	10 39 9.7	40 45.1	9.36591	0.0892	3.98	5.26	21 22 42.3	80
23	22 46 47.98	46 30.12	10 9 4.0	10 41.3	9.37090	0.1073	3.97	5.26	22 22 44.0	81
24	22 52 28.13	52 10.48	9 37 43.5	39 22.4	9.37574	0.1245	3.95	5.25	23 22 45.7	82
25	22 58 12.03	57 54.61	9 5 8.9	6 49.1	9.38043	0.1408	3.95	5.25	24 22 47.5	83
26	23 3 59.62	3 42.46	8 31 21.2	33 2.4	9.38502	0.1564	3.94	5.24	25 22 49.3	84
27	23 9 50.86	9 33.99	7 56 21.1	58 3.1	9.38953	0.1713	3.94	5.23	26 22 51.2	85
28	23 15 45.77	15 29.21	7 20 9.6	21 52.0	9.39402	0.1855	3.95	5.23	27 22 53.2	86
29	23 21 44.35	21 28.13	6 42 47.6	44 30.0	9.39848	0.1990	3.95	5.22	28 22 55.2	87
30	23 27 46.63	27 30.78	6 4 16.0	5 58.1	9.40294	0.2120	3.96	5.22	29 22 57.3	88
31	23 33 52.67	33 37.21	5 24 35.6	26 17.1	9.40746	0.2245	3.97	5.21	30 22 59.5	89
Apr. 1	23 40 2.55	39 47.50	4 43 47.5	45 28.0	9.41202	0.2364	3.98	5.20	0 23 1.7	90
2	23 46 16.36	46 1.74	4 1 52.9	3 32.0	9.41664	0.2478	3.99	5.20	1 23 4.0	91
3	23 52 34.22	52 20.66	3 18 53.0	30 30.3	9.42137	0.2587	4.00	5.19	2 23 6.4	92
4	23 58 56.27	58 49.60	2 34 48.9	36 24.1	9.42620	0.2691	4.02	5.18	3 23 8.8	93
5	0 5 22.64	5 9.49	1 49 42.1	51 14.8	9.43113	0.2790	4.03	5.17	4 23 11.3	94
6	0 11 53.49	11 40.89	1 3 34.3	5 3.9	9.43621	0.2884	4.05	5.16	5 23 13.9	95
7	0 18 28.99	18 16.97	0 16 27.1	17 53.3	9.44142	0.2974	4.06	5.14	6 23 16.5	96
8	0 25 9.34	24 57.93	0 31 37.3	30 14.9	9.44677	0.3059	4.08	5.12	7 23 19.2	97
9	0 31 54.79	31 43.94	1 20 36.6	19 18.5	9.45224	0.3138	4.10	5.10	8 23 22.0	98
10	0 38 45.26	38 35.20	2 10 28.3	9 14.9	9.45786	0.3212	4.12	5.08	9 23 24.9	99
11	0 45 41.21	45 31.89	3 1 9.3	0 1.1	9.46357	0.3280	4.13	5.04	10 23 27.9	100
12	0 52 42.72	52 34.18	3 52 36.1	51 33.5	9.46937	0.3342	4.14	5.00	11 23 31.0	101
13	0 59 49.95	59 42.25	4 44 44.6	43 48.2	9.47526	0.3397	4.15	4.95	12 23 34.2	102
14	1 7 3.05	6 56.24	5 37 30.4	36 40.7	9.48121	0.3444	4.16	4.89	13 23 37.5	103
15	1 14 22.11	14 16.25	6 30 48.3	30 5.7	9.48714	0.3484	4.16	4.80	14 23 40.9	104
16	1 21 47.21	21 42.34	7 24 32.2	23 57.1	9.49304	0.3515	4.16	4.67	15 23 44.4	105
17	1 29 18.35	29 14.54	8 18 35.3	18 8.1	9.49885	0.3536	4.15	4.45	16 23 47.9	106
18	1 36 55.49	36 52.82	9 12 50.2	12 31.3	9.50450	0.3546	4.15	+3.91	17 23 51.6	107
19	1 44 38.50	44 37.03	10 7 8.4	6 58.0	9.50990	0.3544	4.13	-4.17	18 23 55.4	108
20	1 52 27.15	52 26.93	11 1 20.4	1 18.8	9.51499	0.3529	4.11	4.59	19 23 59.3	109
21	2 0 21.11	0 22.20	11 55 16.1	55 23.4	9.51968	0.3500	4.07	4.82	20 0 3.3	110
22	2 8 19.95	8 22.40	12 48 44.4	49 0.6	9.52387	0.3455	4.02	4.97	21 0 7.3	111
23	2 16 23.12	16 26.98	13 41 33.6	41 58.6	9.52747	0.3398	3.94	5.09	22 0 11.4	112
24	2 24 29.93	24 35.23	14 33 31.4	34 4.9	9.53037	0.3313	3.84	5.19	23 0 15.6	113
25	2 32 39.58	32 46.34	15 24 25.1	25 6.7	9.53250	0.3213	3.67	5.27	24 0 19.8	114
26	2 40 51.15	40 59.39	16 14 2.2	14 51.3	9.53375	0.3092	+3.34	5.33	25 0 24.1	115
27	2 49 3.62	49 13.33	17 2 10.3	3 6.3	9.53406	0.2948	-2.68	5.38	26 0 28.4	116
28	2 57 15.88	57 27.03	17 48 37.5	49 39.5	9.53336	0.2782	3.52	5.43	27 0 32.7	117
29	3 5 26.76	5 39.31	18 33 12.7	34 19.7	9.53161	0.2592	3.79	5.47	28 0 36.9	118
30	3 13 35.07	13 48.96	19 15 46.0	16 57.0	9.52877	0.2377	3.96	5.50	29 0 41.1	119
31	3 21 39.57	21 54.73	+19 56 8.7	57 22.6	+9.52481	+0.2136	-4.08	-5.52	30 0 45.3	120

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.			Apparent Declination.		Log Coefficient of t.		Log Coefficient of t ² .		Mean Solar Time of Meridian Transit.	Sidereal Date of Transit.							
	At Mean Noon.	At Transit.		At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.									
May	d	h	m	s	m	s	°	'	"	d	h	m	s	d				
1	3	21	39.57	21	54.73	+19	56'	8.7	57' 22.6"	+9.52481	+0.2136	-4.08	-5.52	1	0	45.3	121	
2	3	29	39.05	29	55.38	20	34	13.7	35 29.4	9.51973	0.1868	4.17	5.54	2	0	49.3	122	
3	3	37	32.35	37	49.73	21	9	55.2	11 11.6	9.51353	0.1572	4.25	5.55	3	0	53.3	123	
4	3	45	18.35	45	36.66	21	43	9.1	44 25.1	9.50621	0.1247	4.31	5.56	4	0	57.1	124	
5	3	52	55.96	53	15.08	22	13	52.9	15 7.4	9.49777	0.0891	4.35	5.56	5	1	0.8	125	
6	4	0	24.20	0	43.99	22	42	5.3	43 17.3	9.48823	0.0502	4.39	5.56	6	1	4.3	126	
7	4	7	42.14	8	2.46	23	7	46.3	8 55.0	9.47758	0.0077	4.42	5.56	7	1	7.7	127	
8	4	14	48.93	15	9.62	23	30	57.2	32 1.8	9.46581	9.9610	4.45	5.55	8	1	10.8	128	
9	4	21	43.76	22	4.69	23	51	40.1	52 39.9	9.45290	9.9096	4.48	5.54	9	1	13.8	129	
10	4	28	25.92	28	46.94	24	9	57.8	10 52.2	9.43884	9.8527	4.50	5.53	10	1	16.6	130	
11	4	34	54.74	35	15.70	24	25	53.9	26 42.4	9.42359	9.7893	4.53	5.52	11	1	19.1	131	
12	4	41	9.61	41	30.37	24	39	32.4	40 14.7	9.40708	9.7174	4.55	5.50	12	1	21.4	132	
13	4	47	9.93	47	30.35	24	50	57.8	51 33.5	9.38920	9.6342	4.57	5.49	13	1	23.4	133	
14	4	52	55.15	53	15.09	25	0	14.8	0 43.8	9.36985	9.5355	4.58	5.47	14	1	25.2	134	
15	4	58	24.73	58	44.07	25	7	28.2	7 50.5	9.34889	9.4135	4.59	5.46	15	1	26.8	135	
16	5	3	38.17	3	56.80	25	12	42.9	12 58.4	9.32619	9.2515	4.61	5.44	16	1	28.0	136	
17	5	8	35.00	8	52.79	25	16	3.9	16 12.7	9.30152	9.0057	4.62	5.42	17	1	29.0	137	
18	5	13	14.73	13	31.58	25	17	36.3	17 38.6	9.27459	+8.4404	4.63	5.40	18	1	29.7	138	
19	5	17	36.90	17	52.71	25	17	25.0	17 21.0	9.24511	-8.6305	4.64	5.38	19	1	30.2	139	
20	5	21	41.06	21	55.75	25	15	35.0	15 24.9	9.21270	9.0397	4.65	5.35	20	1	30.3	140	
21	5	25	26.79	25	40.28	25	12	11.0	11 55.2	9.17681	9.2385	4.66	5.33	21	1	30.0	141	
22	5	28	53.68	29	5.90	25	7	17.8	6 56.7	9.13677	9.3683	4.67	5.31	22	1	29.5	142	
23	5	32	1.33	32	12.24	25	0	59.9	0 34.0	9.09175	9.4634	4.67	5.28	23	1	28.7	143	
24	5	34	49.36	34	58.93	24	53	22.0	52 51.7	9.04056	9.5374	4.68	5.26	24	1	27.5	144	
25	5	37	17.46	37	25.67	24	44	28.5	43 54.3	8.98159	9.5972	4.69	5.24	25	1	26.0	145	
26	5	39	25.35	39	32.20	24	34	23.8	33 46.3	8.91243	9.6469	4.69	5.21	26	1	24.2	146	
27	5	41	12.83	41	18.34	24	23	12.4	22 32.1	8.82936	9.6888	4.70	5.18	27	1	22.1	147	
28	5	42	39.75	42	43.95	24	10	58.5	10 16.2	8.72588	9.7245	4.70	5.14	28	1	19.6	148	
29	5	43	46.06	43	49.01	23	57	46.6	57 2.9	8.58983	9.7551	4.70	5.11	29	1	16.7	149	
30	5	44	31.80	44	33.59	23	43	41.2	42 56.7	8.39199	9.7814	4.69	5.07	30	1	13.5	150	
31	5	44	57.17	44	57.89	23	28	46.9	28 2.3	+8.02576	9.8040	4.68	5.02	31	1	10.0	151	
June	1	5	45	2.51	45	2.28	23	13	8.6	12 24.6	-7.49582	9.8231	4.66	4.97	1	1	6.1	152
2	5	44	48.34	44	47.30	22	56	51.7	56 8.9	8.21675	9.8391	4.65	4.90	2	1	1.9	153	
3	5	44	15.33	44	13.63	22	40	1.6	39 20.7	8.46654	9.8522	4.63	4.81	3	0	57.4	154	
4	5	43	24.34	43	22.15	22	22	44.2	22 5.8	8.61710	9.8624	4.61	4.70	4	0	52.6	155	
5	5	42	16.46	42	13.94	22	5	5.9	4 30.7	8.72194	9.8696	4.58	4.53	5	0	47.6	156	
6	5	40	52.98	40	50.31	21	47	13.7	46 42.1	8.79068	9.8737	4.53	-4.19	6	0	42.3	157	
7	5	39	15.42	39	12.77	21	29	15.1	28 47.5	8.85888	9.8747	4.48	+3.59	7	0	36.7	158	
8	5	37	25.48	37	23.01	21	11	18.1	10 55.0	8.90420	9.8724	4.40	4.39	8	0	30.9	159	
9	5	35	25.09	35	22.92	20	53	31.4	53 13.0	8.93837	9.8664	4.31	4.67	9	0	25.0	160	
10	5	33	16.30	33	14.56	20	36	3.9	35 50.3	8.96306	9.8565	4.17	4.84	10	0	18.9	161	
11	5	31	1.32	31	0.10	20	19	5.0	18 56.1	8.97932	9.8423	3.97	4.96	11	0	12.8	162	
12	5	28	42.46	28	41.82	20	2	44.2	2 39.9	8.98782	9.8232	-3.56	5.06	12	0	6.6	163	
13	5	26	22.08	26	22.04	19	47	11.2	47 11.0	8.98888	9.7987	+3.30	5.14	13	0	0.3	164	
14	5	24	2.53	24	3.10	19	32	35.1	32 38.6	8.98253	9.7682	3.89	5.20	13	23	54.1	165	
15	5	21	46.18	21	47.31	19	19	4.8	19 11.3	8.96862	9.7306	4.12	5.25	14	23	47.9	166	
16	5	19	35.32	19	36.93	19	6	48.6	6 57.4	8.94674	9.6845	4.27	5.29	15	23	41.8	167	
17	5	17	32.10	17	34.10	18	55	54.2	56 4.4	8.91609	9.6279	4.37	5.32	16	23	35.8	168	
18	5	15	38.57	15	40.82	18	46	27.8	46 38.6	8.87537	9.5580	4.44	5.35	17	23	30.0	169	
19	5	13	56.56	13	58.93	18	38	34.8	38 45.3	8.82252	9.4698	4.50	5.37	18	23	24.3	170	
20	5	12	27.73	12	30.07	18	32	19.5	32 28.8	8.75408	9.3541	4.55	5.38	19	23	18.9	171	
21	5	11	13.56	11	15.71	18	27	44.8	27 52.0	8.66374	9.1914	4.59	5.39	20	23	13.8	172	
22	5	10	15.35	10	17.13	18	24	52.2	24 56.6	8.53931	8.9254	4.62	5.39	21	23	8.9	173	
23	5	9	34.18	9	35.44	18	23	42.2	23 43.0	8.35138	-8.1204	4.64	5.39	22	23	4.2	174	
24	5	9	10.94	9	11.54	18	24	13.7	24 10.4	-7.98808	+8.7538	4.66	5.38	23	22	59.9	175	
25	5	9	6.38	9	6.18	18	26	24.9	26 17.0	+7.53887	9.0974	4.67	5.37	24	22	55.9	176	
26	5	9	21.08	9	19.95	18	30	12.9	30 0.0	8.23063	9.2809	4.68	5.35	25	22	52.2	177	
27	5	9	55.50	9	53.34	18	35	33.5	35 15.5	8.48912	9.4045	4.68	5.32	26	22	48.8	178	
28	5	10	49.99	10	46.69	18	42	22.1	41 59.0	8.65187	9.4957	4.69	5.29	27	22	45.8	179	
29	5	12	4.76	12	0.25	18	50	33.2	50 5.0	8.77083	9.5602	4.69	5.25	28	22	43.1	180	
30	5	13	39.96	13	34.19	18	60	0.7	59 27.6	8.86483	9.6223	4.70	5.22	29	22	40.7	181	
31	5	15	35.72	15	28.63	+19	10	37.8	10 0.1	+8.94226	+9.6674	+4.70	+5.18	30	22	38.7	182	

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t .		Log Coefficient of t^2 .		Mean Solar Time of Meridian Transit.			Side- real Date of Transit.
	At Mean Noon.	At Transit.	At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.	d	h	m	
July 1	5 15 35.72	15 28.63	+19 10' 37.8	10' 0.1	+8.94226	+9.6674	+4.70	+5.18	0	22	38.7	182
2	5 17 52.07	17 43.65	19 22 17.2	21 35.3	9.06798	9.7037	4.70	5.12	1	22	37.0	183
3	5 20 29.03	20 19.27	19 34 51.2	34 5.7	9.06503	9.7329	4.70	5.05	2	22	35.6	184
4	5 23 26.55	23 15.46	19 48 11.7	47 23.1	9.11535	9.7559	4.69	4.96	3	22	34.6	185
5	5 26 44.59	26 32.19	20 2 10.2	1 19.1	9.16034	9.7733	4.69	4.84	4	22	34.0	186
6	5 30 23.09	30 9.41	20 16 37.7	15 45.0	9.20099	9.7855	4.69	4.68	5	22	33.7	187
7	5 34 21.99	34 7.09	20 31 25.0	30 31.4	9.23801	9.7929	4.69	4.38	6	22	33.7	188
8	5 38 41.19	38 25.15	20 46 22.3	45 28.6	9.27195	9.7955	4.60	+2.68	7	22	34.0	189
9	5 43 20.59	43 3.49	21 1 19.7	0 26.7	9.30327	9.7931	4.68	-4.40	8	22	34.7	190
10	5 48 20.05	48 1.98	21 16 6.7	15 15.3	9.33228	9.7853	4.68	4.71	9	22	35.7	191
11	5 53 39.41	53 20.48	21 30 32.5	29 43.4	9.35921	9.7718	4.68	4.89	10	22	37.1	192
12	5 59 18.44	58 58.79	21 44 25.8	43 39.8	9.38425	9.7519	4.67	5.03	11	22	38.8	193
13	6 5 16.87	4 56.66	21 57 35.1	56 53.0	9.40758	9.7245	4.66	5.13	12	22	40.8	194
14	6 11 34.37	11 13.75	22 9 48.6	9 11.1	9.42928	9.6878	4.65	5.21	13	22	43.1	195
15	6 18 10.48	17 49.62	22 20 54.3	20 21.9	9.44940	9.6394	4.64	5.28	14	22	45.8	196
16	6 25 4.63	24 43.72	22 30 39.9	30 13.0	9.46799	9.5753	4.62	5.35	15	22	48.8	197
17	6 32 16.14	31 55.38	22 38 53.4	38 32.3	9.48508	9.4885	4.60	5.41	16	22	52.0	198
18	6 39 44.18	39 23.77	22 45 22.0	45 7.8	9.50063	9.3649	4.57	5.45	17	22	55.5	199
19	6 47 27.72	47 7.89	22 49 57.0	49 47.9	9.51464	9.1694	4.54	5.49	18	22	59.3	200
20	6 55 25.61	55 6.55	22 52 24.9	52 21.6	9.52709	+8.7528	4.50	5.52	19	23	3.3	201
21	7 3 36.49	3 18.41	22 52 36.9	52 39.0	9.53795	-8.6125	4.44	5.54	20	23	7.6	202
22	7 11 58.87	11 41.96	22 50 24.4	50 31.3	9.54721	9.1580	4.38	5.56	21	23	12.0	203
23	7 20 31.12	20 15.56	22 45 40.5	45 51.3	9.55485	9.3907	4.29	5.58	22	23	16.6	204
24	7 29 11.48	28 57.43	22 38 19.9	38 33.8	9.56085	9.5579	4.18	5.59	23	23	21.4	205
25	7 37 58.11	37 45.70	22 28 19.2	28 35.2	9.56525	9.6750	4.03	5.59	24	23	26.2	206
26	7 46 49.17	46 38.50	22 15 37.0	15 53.9	9.56811	9.7673	3.79	5.59	25	23	31.1	207
27	7 55 42.80	55 33.94	22 0 14.0	0 30.6	9.56947	9.8429	+3.27	5.58	26	23	36.1	208
28	8 4 37.21	4 30.19	21 42 12.6	42 27.8	9.56940	9.9059	-3.35	5.56	27	23	41.1	209
29	8 13 30.71	13 25.54	21 21 37.0	21 49.7	9.56800	9.9502	3.78	5.55	28	23	46.0	210
30	8 22 21.74	22 18.41	20 58 33.1	58 42.2	9.56538	0.0048	3.97	5.53	29	23	51.0	211
31	8 31 8.90	31 7.38	20 33 7.9	33 12.5	9.56165	0.0439	4.09	5.50	30	23	55.8	212
Aug. 1	8 39 50.98	39 51.20	20 5 29.4	5 28.7	9.55694	0.0777	4.17	5.47	1	0	0.6	213
2	8 48 26.91	48 28.79	19 35 46.3	35 39.6	9.55138	0.1070	4.23	5.44	2	0	5.3	214
3	8 56 55.82	56 59.27	19 4 7.8	3 54.5	9.54509	0.1324	4.27	5.40	3	0	9.8	215
4	9 5 17.05	5 21.97	18 30 43.2	30 22.9	9.53817	0.1543	4.30	5.37	4	0	14.3	216
5	9 13 30.07	13 36.36	17 55 41.7	55 14.1	9.53075	0.1733	4.32	5.33	5	0	18.5	217
6	9 21 34.49	21 42.05	17 19 12.6	18 37.5	9.52291	0.1899	4.33	5.28	6	0	22.7	218
7	9 29 30.05	29 38.77	16 41 24.8	40 42.1	9.51474	0.2042	4.34	5.23	7	0	26.7	219
8	9 37 16.61	37 26.40	16 2 26.8	1 36.6	9.50632	0.2165	4.34	5.17	8	0	30.5	220
9	9 44 54.13	45 4.89	15 22 26.7	21 20.0	9.49773	0.2270	4.34	5.12	9	0	34.2	221
10	9 52 22.63	52 34.27	14 41 32.1	40 27.1	9.48904	0.2360	4.33	5.06	10	0	37.7	222
11	9 59 42.21	59 54.64	13 59 50.1	58 38.0	9.48029	0.2437	4.32	4.99	11	0	41.1	223
12	10 6 53.01	7 6.15	13 17 27.2	16 8.3	9.47152	0.2501	4.31	4.92	12	0	44.4	224
13	10 13 55.22	14 9.00	12 34 29.8	33 4.3	9.46277	0.2554	4.30	4.84	13	0	47.5	225
14	10 20 49.03	21 3.37	11 51 3.5	49 31.8	9.45407	0.2598	4.29	4.75	14	0	50.4	226
15	10 27 34.66	27 49.50	11 7 13.5	5 35.9	9.44546	0.2633	4.28	4.65	15	0	53.2	227
16	10 34 12.37	34 27.66	10 23 4.8	21 21.6	9.43694	0.2660	4.27	4.53	16	0	55.9	228
17	10 40 42.41	40 58.09	9 38 41.9	36 53.5	9.42851	0.2679	4.25	4.37	17	0	58.5	229
18	10 47 5.00	47 21.02	8 54 9.1	52 15.9	9.42021	0.2692	4.24	4.17	18	1	0.9	230
19	10 53 20.40	53 36.72	8 9 30.1	7 32.4	9.41203	0.2699	4.22	-3.80	19	1	3.2	231
20	10 59 28.86	59 45.44	7 24 48.5	22 46.7	9.40398	0.2700	4.21	+3.38	20	1	5.4	232
21	11 5 30.61	5 47.41	6 40 7.8	38 2.2	9.39606	0.2696	4.20	3.98	21	1	7.5	233
22	11 11 25.87	11 42.85	5 55 31.1	53 22.1	9.38825	0.2687	4.18	4.23	22	1	9.5	234
23	11 17 14.83	17 31.96	5 11 1.4	8 49.3	9.38055	0.2673	4.17	4.39	23	1	11.4	235
24	11 22 57.70	23 14.95	4 26 41.4	24 26.6	9.37296	0.2655	4.15	4.48	24	1	13.1	236
25	11 28 34.67	28 52.01	3 42 33.8	40 16.7	9.36546	0.2633	4.14	4.56	25	1	14.8	237
26	11 34 5.89	34 23.30	2 58 41.2	56 22.1	9.35802	0.2606	4.13	4.62	26	1	16.4	238
27	11 39 31.52	39 48.97	2 15 5.9	12 45.1	9.35065	0.2575	4.12	4.67	27	1	17.8	239
28	11 44 51.69	45 9.15	1 31 50.2	29 28.0	9.34332	0.2541	4.11	4.72	28	1	19.2	240
29	11 50 6.51	50 23.96	0 48 56.4	46 33.1	9.33599	0.2502	4.10	4.76	29	1	20.5	241
30	11 55 16.06	55 33.48	+ 0 6 26.7	4 2.7	9.32866	0.2459	4.10	4.80	30	1	21.7	242
31	12 0 20.41	0 37.78	- 0 35 36.6	38 0.9	+9.32130	-0.2411	-4.09	+4.84	31	1	22.9	243

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.			Apparent Declination.			Log Coefficient of t.		Log Coefficient of t ² .		Mean Solar Time of Meridian Transit.	Side- real Date of Transit.
	At Mean Noon.	At Transit.		At Mean Noon.	At Transit.		In R.A.	In Dec.	In R.A.	In Dec.		
Sept. 1	d h m s	m s		° ' "	' "						d h m	d
2	12 5 19.62	5 36.90	-	1 17 11.3	19 35.6	+0.31385	-0.2360	-4.09	+4.87		1 1 23.9	244
3	12 10 13.70	10 30.87		1 58 15.3	60 39.4	9.30627	0.2304	4.09	4.90		2 1 24.9	245
4	12 15 2.64	15 19.68		2 38 46.3	41 9.9	9.29854	0.2243	4.09	4.93		3 1 25.7	246
5	12 19 46.42	20 3.30		3 18 41.9	21 4.7	9.29058	0.2176	4.10	4.95		4 1 26.5	247
6	12 24 24.97	24 41.67		3 57 59.8	60 21.4	9.28237	0.2105	4.11	4.98		5 1 27.2	248
7	12 28 58.19	29 14.68		4 36 37.6	38 57.6	9.27381	0.2028	4.12	5.01		6 1 27.8	249
8	12 33 25.96	33 42.21		5 14 32.8	16 50.9	9.26483	0.1944	4.14	5.04		7 1 28.3	250
9	12 37 48.11	38 4.08		5 51 42.6	53 58.5	9.25535	0.1853	4.15	5.07		8 1 28.8	251
10	12 42 4.42	42 20.08		6 28 4.0	30 17.3	9.24527	0.1753	4.17	5.09		9 1 29.1	252
11	12 46 14.64	46 29.96		7 3 34.0	5 44.3	9.23446	0.1645	4.19	5.12		10 1 29.3	253
12	12 50 18.48	50 33.41		7 38 9.2	40 16.2	9.22278	0.1527	4.21	5.15		11 1 29.4	254
13	12 54 15.58	54 30.08		8 11 46.2	13 49.5	9.21008	0.1397	4.24	5.18		12 1 29.4	255
14	12 58 5.54	58 19.57		8 44 21.1	46 20.2	9.19616	0.1254	4.26	5.21		13 1 29.3	256
15	13 1 47.89	2 1.39		9 15 49.6	17 44.1	9.18079	0.1097	4.29	5.23		14 1 29.1	257
16	13 5 22.09	5 35.00		9 46 7.3	47 56.8	9.16366	0.0922	4.32	5.26		15 1 28.7	258
17	13 8 47.52	8 59.79		10 15 9.1	16 53.1	9.14444	0.0725	4.36	5.29		16 1 28.2	259
18	13 12 3.51	12 15.09		10 42 49.4	44 27.5	9.12269	0.0504	4.39	5.32		17 1 27.5	260
19	13 15 9.25	15 20.11		11 9 2.2	10 33.9	9.09784	0.0254	4.43	5.35		18 1 26.6	261
20	13 18 3.99	18 14.00		11 33 40.9	35 5.7	9.06918	9.9967	4.46	5.39		19 1 25.6	262
21	13 20 46.70	20 55.83		11 56 38.0	57 55.3	9.03573	9.9634	4.50	5.42		20 1 24.3	263
22	13 23 16.36	23 24.55		12 17 45.3	18 54.7	8.99616	9.9242	4.53	5.46		21 1 22.9	264
23	13 25 31.81	25 30.00		12 36 53.8	37 54.8	8.94867	9.8774	4.57	5.49		22 1 21.2	265
24	13 27 31.85	27 37.98		12 53 53.6	54 45.8	8.89044	9.8202	4.60	5.53		23 1 19.2	266
25	13 29 15.16	29 20.18		13 8 33.8	9 16.7	8.81693	9.7481	4.64	5.56		24 1 17.0	267
26	13 30 40.33	30 44.21		13 30 42.5	21 15.8	8.79028	9.6537	4.67	5.60		25 1 14.5	268
27	13 31 45.90	31 48.62		13 30 6.8	30 30.3	8.58413	9.5206	4.71	5.63		26 1 11.6	269
28	13 32 30.36	32 31.92		13 36 32.7	36 46.3	8.36539	9.3067	4.74	5.66		27 1 8.4	270
29	13 32 52.22	32 52.65		13 39 45.3	39 49.2	+7.84510	-8.8001	4.76	5.70		28 1 4.8	271
30	13 32 50.07	32 49.43		13 39 29.3	39 23.8	-8.00599	+8.9399	4.78	5.73		29 1 0.8	272
Oct. 1	13 32 22.62	32 21.01		13 35 29.3	35 15.1	8.44888	9.3945	4.80	5.76		30 0 56.4	273
2	13 31 28.79	31 26.36		13 27 30.0	27 8.2	8.66966	9.6225	4.82	5.79		1 0 51.6	274
3	13 30 7.84	30 4.78		13 15 17.3	14 49.4	8.81776	9.7777	4.82	5.81		2 0 46.3	275
4	13 28 19.51	28 16.06		12 58 39.9	58 7.9	8.92782	9.8957	4.81	5.82		3 0 40.6	276
5	13 26 4.16	26 0.61		12 37 30.2	36 56.5	9.01353	9.9900	4.80	5.82		4 0 34.4	277
6	13 23 22.89	23 19.54		12 11 45.9	11 13.5	9.08127	0.0671	4.76	5.81		5 0 27.7	278
7	13 20 17.71	20 14.88		11 41 32.4	41 4.4	9.13436	0.1304	4.70	5.79		6 0 20.7	279
8	13 16 51.64	16 49.64		11 7 4.1	6 43.8	9.17458	0.1817	4.61	5.75		7 0 13.4	280
9	13 13 8.74	13 7.82		10 28 46.3	28 36.6	9.20281	0.2220	4.46	5.67		8 0 5.8	281
10	13 9 14.08	9 14.42		9 47 15.6	47 19.2	9.21933	0.2518	-4.15	5.54		8 23 58.0	282
11	13 5 13.63	5 15.29		9 3 20.5	3 39.0	9.22398	0.2711	+3.30	5.32		9 23 50.1	283
12	13 1 14.03	1 16.96		8 17 59.5	18 33.4	9.21616	0.2797	4.28	+4.69		10 23 42.2	284
13	12 57 22.25	57 26.27		7 32 18.7	33 7.1	9.19486	0.2774	4.55	-5.08		11 23 34.4	285
14	12 53 45.26	53 50.05		6 47 27.9	48 28.7	9.15840	0.2636	4.71	5.46		12 23 26.9	286
15	12 50 29.64	50 34.77		6 4 37.0	5 46.7	9.10395	0.2376	4.82	5.65		13 23 19.7	287
16	12 47 41.21	47 46.23		5 24 51.1	26 5.5	9.09670	0.1984	4.89	5.77		14 23 13.0	288
17	12 45 24.80	45 29.23		4 49 7.1	50 21.6	8.91751	0.1442	4.93	5.84		15 23 6.8	289
18	12 43 44.01	43 47.40		4 18 11.1	19 20.9	8.75598	0.0721	4.96	5.89		16 23 1.1	290
19	12 42 41.18	42 43.14		3 52 36.5	53 37.5	8.47893	9.9771	4.98	5.92		17 22 56.1	291
20	12 42 17.43	42 17.67		3 32 44.5	33 33.1	-7.45654	9.8488	4.98	5.93		18 22 51.8	292
21	12 42 32.76	42 31.08		3 18 44.2	19 17.8	+8.38097	9.6639	4.96	5.93		19 22 48.1	293
22	12 43 26.21	43 22.51		3 10 34.0	10 51.0	8.69891	+9.3439	4.94	5.91		20 22 45.0	294
23	12 44 56.05	44 50.32		3 8 3.8	8 3.5	8.67224	-8.0060	4.91	5.89		21 22 42.5	295
24	12 46 50.98	46 52.30		3 10 56.7	10 39.1	8.98811	9.3568	4.87	5.86		22 22 40.6	296
25	12 49 35.34	49 25.84		3 18 50.9	18 16.7	9.07246	9.6318	4.83	5.82		23 22 39.2	297
26	12 52 39.27	52 26.12		3 31 21.6	30 32.0	9.13669	9.7862	4.79	5.78		24 22 38.3	298
27	12 56 8.84	55 56.24		3 48 1.9	46 58.6	9.18694	9.8804	4.74	5.73		25 22 37.9	299
28	12 60 1.18	59 47.34		4 8 24.7	7 9.4	9.22697	9.9640	4.68	5.67		26 22 37.8	300
29	13 4 13.56	3 58.69		4 32 3.4	30 37.8	9.25922	0.0200	4.62	5.61		27 22 38.0	301
30	13 8 43.42	8 27.73		4 58 31.9	56 57.9	9.28545	0.0631	4.56	5.54		28 22 38.6	302
31	13 13 28.44	13 12.11		5 27 25.9	25 45.3	9.30691	0.0968	4.50	5.46		29 22 39.4	303
32	13 18 26.53	18 9.73		5 58 23.0	56 37.5	9.32455	0.1231	4.43	5.38		30 22 40.4	304
	13 23 35.85	23 18.74	-	6 31 2.8	29 13.8	+9.33913	-0.1437	+4.36	-5.30		31 22 41.6	305

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.				Apparent Declination.				Log Coefficient of t.		Log Coefficient of t ² .		Mean Solar Time of Meridian Transit.	Sidereal Date of Transit.			
	At Mean Noon.		At Transit.		At Mean Noon.		At Transit.		In R.A.	In Dec.	In R.A.	In Dec.					
Nov.	d	h	m	s	m	s	°	'					d	h	m	s	
	1	13	23	35.85	23	18.74	6	31	2.8	+0.33913	-0.1437	+4.36	-5.30	0	22	41.6	305
	2	13	28	54.77	28	37.48	7	5	6.3	0.35121	0.1597	4.20	5.21	1	22	42.9	306
	3	13	34	21.88	34	4.53	7	40	16.8	0.36125	0.1719	4.22	5.10	2	22	44.4	307
	4	13	39	56.00	39	38.69	8	16	19.3	0.36763	0.1810	4.15	4.97	3	22	46.0	308
	5	13	45	36.10	45	18.92	8	53	0.2	0.37668	0.1875	4.09	4.81	4	22	47.8	309
	6	13	51	21.32	51	4.34	9	30	7.9	0.38265	0.1917	4.02	4.60	5	22	49.6	310
	7	13	57	10.94	56	54.22	10	7	32.2	0.38773	0.1938	3.96	-4.25	6	22	51.5	311
	8	14	3	4.38	2	47.96	10	45	3.9	0.39209	0.1943	3.90	+3.38	7	22	53.4	312
	9	14	9	1.14	8	45.06	11	22	34.7	0.39587	0.1934	3.85	4.29	8	22	55.4	313
	10	14	15	0.80	14	45.12	11	59	57.5	0.39918	0.1913	3.80	4.53	9	22	57.5	314
	11	14	21	3.06	20	47.81	12	37	6.3	0.40212	0.1880	3.75	4.68	10	22	59.6	315
	12	14	27	7.66	26	52.86	13	13	55.4	0.40478	0.1836	3.71	4.78	11	23	1.7	316
	13	14	33	14.4	33	0.07	13	50	19.8	0.40721	0.1783	3.68	4.84	12	23	3.9	317
	14	14	39	23.11	39	9.27	14	26	15.3	0.40946	0.1721	3.65	4.89	13	23	6.1	318
	15	14	45	33.68	45	20.35	15	1	37.9	0.41158	0.1650	3.63	4.94	14	23	8.3	319
	16	14	51	46.02	51	33.22	15	36	24.3	0.41361	0.1571	3.62	4.98	15	23	10.6	320
	17	14	58	0.08	57	47.82	16	10	31.2	0.41558	0.1484	3.61	5.01	16	23	12.9	321
	18	15	4	15.82	4	4.11	16	43	55.8	0.41750	0.1389	3.60	5.03	17	23	15.2	322
	19	15	10	33.22	10	22.07	17	16	35.6	0.41940	0.1287	3.60	5.05	18	23	17.5	323
	20	15	16	52.27	16	41.70	17	48	28.1	0.42130	0.1177	3.60	5.07	19	23	19.9	324
	21	15	23	12.08	23	3.00	18	19	31.1	0.42321	0.1059	3.61	5.09	20	23	22.3	325
	22	15	29	35.37	29	25.99	18	40	42.8	0.42513	0.0933	3.62	5.10	21	23	24.8	326
	23	15	35	59.47	35	50.71	19	19	1.1	0.42705	0.0799	3.62	5.12	22	23	27.2	327
	24	15	42	25.28	42	17.15	19	47	24.1	0.42899	0.0656	3.63	5.13	23	23	29.7	328
	25	15	48	52.83	48	45.34	20	14	50.1	0.43097	0.0504	3.63	5.15	24	23	32.3	329
	26	15	55	22.16	55	15.33	20	41	17.5	0.43297	0.0341	3.64	5.16	25	23	34.8	330
	27	16	1	53.28	1	47.12	21	6	44.7	0.43497	0.0167	3.64	5.17	26	23	37.4	331
	28	16	8	26.21	8	20.74	21	31	10.0	0.43698	0.0081	3.65	5.18	27	23	40.0	332
	29	16	15	0.98	14	56.21	21	54	32.0	0.43900	0.0000	3.65	5.19	28	23	42.6	333
	30	16	21	37.60	21	33.55	22	16	49.1	0.44103	0.0070	3.65	5.20	29	23	45.3	334
Dec.	1	16	23	16.08	23	12.76	22	38	0.0	0.44305	0.0030	3.65	5.21	0	23	48.0	335
	2	16	34	56.41	34	53.83	22	58	3.0	0.44506	0.0002	3.65	5.22	1	23	50.7	336
	3	16	41	38.59	41	36.77	23	16	56.6	0.44704	0.0024	3.65	5.23	2	23	53.5	337
	4	16	48	22.63	48	21.56	23	34	39.4	0.44900	0.0032	3.64	5.24	3	23	56.3	338
	5	16	55	8.42	55	8.18	23	51	9.9	0.45091	0.0012	3.63	5.25	4	23	59.1	339
	6	17	1	56.01	1	56.58	24	6	26.7	0.45278	0.0000	3.62	5.26	5	0	2.0	340
	7	17	8	45.32	8	46.71	24	20	28.5	0.45459	0.0027	3.60	5.27	6	0	4.9	341
	8	17	15	36.30	15	38.53	24	33	13.9	0.45631	0.0028	3.58	5.28	7	0	7.8	342
	9	17	22	28.88	22	31.96	24	44	41.3	0.45794	0.0031	3.55	5.29	8	0	10.7	343
	10	17	29	22.6	29	26.90	24	54	49.3	0.45947	0.0050	3.53	5.20	9	0	13.7	344
	11	17	36	18.45	36	23.27	25	3	36.7	0.46108	0.0087	3.50	5.30	10	0	16.7	345
	12	17	43	15.24	43	20.95	25	11	2.0	0.46217	0.0117	3.45	5.31	11	0	19.7	346
	13	17	50	13.19	50	19.80	25	17	3.8	0.46330	0.0164	3.39	5.31	12	0	22.7	347
	14	17	57	12.15	57	19.66	25	21	40.9	0.46426	0.0214	3.31	5.32	13	0	25.8	348
	15	18	4	11.95	4	20.36	25	24	52.0	0.46504	0.0210	3.20	5.32	14	0	28.8	349
	16	18	11	12.40	11	21.72	25	26	35.9	0.46561	-0.0190	3.04	5.33	15	0	31.9	350
	17	18	18	13.30	18	23.52	25	26	51.5	0.46594	+0.3025	+2.68	5.33	16	0	35.0	351
	18	18	25	14.40	25	25.33	25	25	37.7	0.46603	0.0167	-1.18	5.34	17	0	38.0	352
	19	18	32	15.45	32	27.47	25	22	53.4	0.46583	0.1634	2.91	5.34	18	0	41.1	353
	20	18	39	16.15	39	29.05	25	18	37.8	0.46529	0.3208	3.21	5.35	19	0	44.2	354
	21	18	46	16.16	46	29.93	25	12	50.2	0.46439	0.4360	3.40	5.36	20	0	47.3	355
	22	18	53	15.12	53	29.74	25	5	30.0	0.46310	0.5280	3.54	5.35	21	0	50.3	356
	23	19	0	12.63	0	28.07	24	56	36.7	0.46136	0.6049	3.67	5.35	22	0	53.3	357
	24	19	7	8.22	7	24.44	24	46	10.2	0.45909	0.6656	3.77	5.35	23	0	56.3	358
	25	19	14	1.36	14	18.31	24	34	10.6	0.45623	0.7258	3.86	5.35	24	0	59.3	359
	26	19	20	51.49	21	9.12	24	20	38.3	0.45270	0.7752	3.95	5.34	25	1	2.2	360
	27	19	27	37.96	27	56.21	24	5	34.2	0.44840	0.8191	4.03	5.34	26	1	5.0	361
	28	19	34	27.02	34	38.82	23	48	59.4	0.44321	0.8584	4.10	5.33	27	1	7.8	362
	29	19	40	56.84	41	16.10	23	30	55.8	0.43698	0.8936	4.17	5.32	28	1	10.4	363
	30	19	47	27.49	47	47.11	23	11	25.9	0.42954	0.9251	4.24	5.30	29	1	13.0	364
	31	19	53	50.90	54	10.77	22	50	32.8	0.42069	0.9533	4.31	5.28	30	1	15.5	365
	32	20	0	5.87	0	25.86	22	28	20.4	+0.41017	+0.9784	-4.37	+5.25	31	1	17.8	366

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.			Apparent Declination.			Log Factor ι .		Log Factor ι' .		Mean Solar Time of Meridian Transit.	Side- real Date of Transit.
	At Mean Noon.	At Transit.		At Mean Noon.	At Transit.		In R.A.	In Dec.	In R.A.	In Dec.		
Jan. d	h m s	m s		° ' "	' "						d h m	d
1	19 10 16.67	10 22.78		23 22' 3.9	21 56.8		+9.35661	+9.4741	-3.20	+5.01	1 0 26.9	0
2	19 15 43.66	15 50.11		23 14 33.5	14 24.2		9.35576	9.5156	3.24	5.01	2 0 28.4	1
3	19 21 9.98	21 16.73		23 6 20.2	6 9.5		9.35483	9.5534	3.28	5.01	3 0 29.8	2
4	19 26 35.57	26 42.62		22 57 24.3	57 12.2		9.35383	9.5877	3.31	5.00	4 0 31.2	3
5	19 32 0.38	32 7.72		22 47 46.3	47 32.7		9.35273	9.6191	3.33	5.00	5 0 32.7	4
6	19 37 24.35	37 32.02		22 37 26.6	37 11.4		9.35152	9.6482	3.35	5.00	6 0 34.2	5
7	19 42 47.44	42 55.44		22 26 25.6	26 8.7		9.35034	9.6752	3.36	4.99	7 0 35.7	6
8	19 48 9.60	48 17.90		22 14 43.7	14 24.9		9.34908	9.7005	3.37	4.98	8 0 37.1	7
9	19 53 30.80	53 39.38		22 2 21.3	2 0.7		9.34778	9.7240	3.40	4.97	9 0 38.5	8
10	19 58 51.01	58 59.87		21 49 19.0	48 56.7		9.34640	9.7460	3.41	4.96	10 0 39.9	9
11	20 4 10.18	4 19.32		21 35 37.4	35 13.3		9.34494	9.7665	3.42	4.96	11 0 41.3	10
12	20 9 28.27	9 37.69		21 21 17.1	20 51.0		9.34344	9.7860	3.43	4.95	12 0 42.7	11
13	20 14 45.25	14 54.94		21 6 18.6	5 50.5		9.34192	9.8043	3.44	4.95	13 0 44.1	12
14	20 20 1.10	20 11.04		20 50 42.5	50 12.4		9.34034	9.8216	3.44	4.94	14 0 45.4	13
15	20 25 15.79	25 25.98		20 34 29.3	33 57.1		9.33871	9.8381	3.46	4.94	15 0 46.7	14
16	20 30 29.29	30 39.72		20 17 39.7	17 5.4		9.33703	9.8536	3.46	4.93	16 0 48.0	15
17	20 35 41.58	35 52.25		20 0 14.5	59 38.1		9.33539	9.8682	3.48	4.91	17 0 49.3	16
18	20 40 52.67	41 3.56		19 42 14.4	41 35.9		9.33366	9.8821	3.49	4.91	18 0 50.5	17
19	20 46 2.51	46 13.61		19 23 40.1	22 59.5		9.33191	9.8953	3.49	4.90	19 0 51.7	18
20	20 51 11.09	51 22.40		19 4 32.3	3 49.5		9.33011	9.9078	3.50	4.90	20 0 52.9	19
21	20 56 18.38	56 29.90		18 44 51.6	44 6.7		9.32825	9.9199	3.50	4.87	21 0 54.1	20
22	21 1 24.36	1 36.06		18 24 38.6	23 51.5		9.32637	9.9312	3.48	4.87	22 0 55.2	21
23	21 6 29.03	6 40.92		18 3 54.3	3 5.0		9.32459	9.9420	3.50	4.86	23 0 56.3	22
24	21 11 32.43	11 44.50		17 42 39.3	41 47.9		9.32270	9.9524	3.48	4.85	24 0 57.4	23
25	21 16 34.53	16 46.78		17 20 54.3	20 0.8		9.32090	9.9622	3.50	4.83	25 0 58.5	24
26	21 21 35.36	21 47.78		16 58 40.3	57 44.5		9.31902	9.9715	3.50	4.82	26 0 59.6	25
27	21 26 34.89	26 47.49		16 35 58.0	35 0.0		9.31711	9.9804	3.49	4.81	27 1 0.7	26
28	21 31 33.11	31 45.86		16 12 48.2	11 48.1		9.31523	9.9889	3.48	4.80	28 1 1.7	27
29	21 36 30.06	36 42.95		15 49 11.5	48 9.3		9.31337	9.9970	3.48	4.78	29 1 2.7	28
30	21 41 25.73	41 38.78		15 25 8.8	24 4.4		9.31154	0.0047	3.48	4.77	30 1 3.7	29
Feb. 31	21 46 20.16	46 33.35		15 0 40.9	59 34.4		9.30966	0.0121	3.46	4.75	31 1 4.7	30
1	21 51 13.34	51 26.67		14 35 48.5	34 40.0		9.30785	0.0191	3.46	4.74	32 1 5.6	31
2	21 56 5.31	56 18.77		14 10 32.3	9 21.7		9.30608	0.0258	3.45	4.73	33 1 6.5	32
3	22 0 56.09	1 9.67		13 44 53.1	43 40.5		9.30429	0.0322	3.44	4.71	34 1 7.4	33
4	22 5 45.69	5 59.40		13 18 51.7	17 37.1		9.30255	0.0382	3.43	4.69	35 1 8.3	34
5	22 10 34.14	10 47.97		12 52 28.9	51 12.3		9.30083	0.0440	3.42	4.68	36 1 9.2	35
6	22 15 21.46	15 35.40		12 25 45.5	24 27.0		9.29913	0.0495	3.39	4.66	37 1 10.0	36
7	22 20 7.68	20 21.73		11 58 42.2	57 21.9		9.29755	0.0547	3.39	4.64	38 1 10.8	37
8	22 24 52.87	25 7.02		11 31 19.9	29 57.8		9.29597	0.0596	3.38	4.62	39 1 11.6	38
9	22 29 37.03	29 51.29		11 3 39.4	2 15.4		9.29442	0.0643	3.37	4.60	40 1 12.4	39
10	22 34 20.18	34 34.56		10 35 41.3	34 15.4		9.29288	0.0687	3.36	4.59	41 1 13.3	40
11	22 39 2.34	39 16.81		10 7 26.5	5 58.9		9.29135	0.0729	3.33	4.56	42 1 14.0	41
12	22 43 43.55	43 58.11		9 38 55.8	37 26.6		9.28996	0.0768	3.32	4.54	43 1 14.7	42
13	22 48 23.87	48 38.53		9 10 9.9	8 39.1		9.28861	0.0806	3.31	4.52	44 1 15.4	43
14	22 53 3.33	53 18.08		8 41 9.5	39 37.1		9.28728	0.0841	3.29	4.50	45 1 16.1	44
15	22 57 41.95	57 56.79		8 11 55.4	10 21.5		9.28598	0.0874	3.26	4.46	46 1 16.8	45
16	23 2 19.76	2 34.69		7 42 28.5	40 53.1		9.28476	0.0905	3.23	4.44	47 1 17.5	46
17	23 6 56.81	7 11.82		7 12 49.5	11 12.7		9.28360	0.0933	3.22	4.41	48 1 18.1	47
18	23 11 33.13	11 48.23		6 42 59.3	41 21.0		9.28245	0.0959	3.19	4.37	49 1 18.8	48
19	23 16 8.75	16 23.94		6 12 58.6	11 18.9		9.28143	0.0983	3.18	4.36	50 1 19.4	49
20	23 20 43.73	20 59.02		5 42 48.1	41 7.0		9.28044	0.1007	3.16	4.29	51 1 20.2	50
21	23 25 18.09	25 33.47		5 12 28.4	10 46.1		9.27945	0.1026	3.13	4.26	52 1 20.8	51
22	23 29 51.85	30 7.31		4 42 0.9	40 17.3		9.27850	0.1044	3.08	4.22	53 1 21.4	52
23	23 34 25.05	34 40.59		4 11 26.0	9 41.3		9.27774	0.1062	3.06	4.16	54 1 22.0	53
24	23 38 57.76	39 13.41		3 40 44.3	38 58.4		9.27686	0.1077	2.99	4.08	55 1 22.7	54
25	23 43 29.97	43 45.70		3 9 56.5	8 9.4		9.27621	0.1090	2.96	3.99	56 1 23.3	55
26	23 48 1.78	48 17.61		2 39 3.5	37 15.4		9.27554	0.1101	2.89	3.94	57 1 23.9	56
27	23 52 33.20	52 49.10		2 8 6.2	6 17.1		9.27499	0.1110	2.83	3.86	58 1 24.4	57
28	23 57 4.30	57 20.29		1 37 5.3	35 15.3		9.27451	0.1118	2.81	3.68	59 1 25.0	58
29	0 1 35.11	1 51.18		1 6 1.5	4 10.8		9.27405	0.1124	2.68	3.53	60 1 25.5	60
30	0 6 5.66	6 21.83		0 34 55.4	33 3.9		9.27369	0.1129	2.64	3.16	61 1 26.1	61
31	0 10 36.00	10 52.27		0 3 47.8	1 55.4		+9.27337	+0.1131	-2.53	+2.38	62 1 26.7	62

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.			Apparent Declination.			Log Factor 1.		Log Factor 2.		Mean Solar Time of Meridian Transit.	Side- real Date of Transit.
	At Mean Noon.	At Transit.		At Mean Noon.	At Transit.		In R.A.	In Dec.	In R.A.	In Dec.		
	d h m s	m s		° ' "	' "						d h m	d
Mar. 1	0 1 35.11	1 51.18	-	1° 6' 15"	4 10.8	+9.27405	+0.1124	-2.68	+3.53		60 1 25.5	60
2	0 6 5.66	6 21.83		0 34 55.4	33 3.9	9.27369	0.1129	2.64	3.16		61 1 26.1	61
3	0 10 36.00	10 52.27	-	0 3 47.8	1 55.4	9.27337	0.1131	2.53	+2.38		62 1 26.7	62
4	0 15 6.16	15 22.51	+	0 27 20.5	29 13.8	9.27308	0.1132	2.16	-3.68		63 1 27.2	63
5	0 19 36.18	19 52.64		0 58 28.9	60 22.8	9.27296	0.1131	1.68	3.53		64 1 27.8	64
6	0 24 6.14	24 22.69		1 29 36.7	31 31.2	9.27289	0.1129	-1.38	3.68		65 1 28.3	65
7	0 28 36.07	28 52.73		2 0 43.0	2 38.2	9.27288	0.1124	+1.99	3.80		66 1 28.9	66
8	0 33 6.01	33 22.79		2 31 47.1	33 42.9	9.27292	0.1119	2.29	3.94		67 1 29.5	67
9	0 37 36.00	37 52.88		3 2 48.4	4 44.6	9.27302	0.1111	2.53	4.03		68 1 30.0	68
10	0 42 6.08	42 23.07		3 33 46.1	35 42.7	9.27323	0.1102	2.64	4.08		69 1 30.6	69
11	0 46 36.31	46 53.41		4 4 39.4	6 36.4	9.27349	0.1088	2.72	4.13		70 1 31.1	70
12	0 51 6.72	51 23.95		4 35 27.7	37 25.2	9.27382	0.1078	2.81	4.19		71 1 31.7	71
13	0 55 37.36	55 54.71		5 6 10.3	8 8.2	9.27419	0.1064	2.89	4.22		72 1 32.3	72
14	1 0 8.26	0 25.73		5 36 46.5	38 44.6	9.27469	0.1048	2.91	4.29		73 1 32.8	73
15	1 4 39.48	4 57.06		6 7 15.5	9 13.8	9.27520	0.1030	2.96	4.33		74 1 33.3	74
16	1 9 11.04	9 28.76		6 37 36.5	39 35.0	9.27579	0.1010	3.01	4.36		75 1 33.9	75
17	1 13 42.99	14 0.87		7 7 48.6	9 47.3	9.27645	0.0987	3.04	4.38		76 1 34.6	76
18	1 18 15.37	18 33.40		7 37 51.1	39 50.0	9.27715	0.0964	3.08	4.41		77 1 35.2	77
19	1 22 48.21	23 6.40		8 7 43.4	9 42.4	9.27791	0.0938	3.11	4.46		78 1 35.9	78
20	1 27 21.55	27 39.89		8 37 24.8	39 23.8	9.27877	0.0911	3.11	4.47		79 1 36.5	79
21	1 31 55.43	32 13.92		9 6 54.6	8 53.5	9.27961	0.0881	3.14	4.51		80 1 37.1	80
22	1 36 29.86	36 48.50		9 36 12.0	38 10.8	9.28048	0.0849	3.19	4.53		81 1 37.7	81
23	1 41 4.87	41 23.68		10 5 15.9	7 14.6	9.28149	0.0815	3.20	4.55		82 1 38.4	82
24	1 45 40.53	45 59.50		10 34 5.7	36 4.1	9.28252	0.0779	3.21	4.57		83 1 39.0	83
25	1 50 16.85	50 36.01		11 2 40.9	4 39.0	9.28359	0.0741	3.22	4.59		84 1 39.7	84
26	1 54 53.86	55 13.18		11 31 0.6	32 58.4	9.28465	0.0700	3.25	4.60		85 1 40.3	85
27	1 59 31.57	59 51.07		11 59 4.0	61 1.5	9.28578	0.0657	3.29	4.63		86 1 41.0	86
28	2 4 10.03	4 29.73		12 26 50.5	28 47.6	9.28702	0.0612	3.28	4.64		87 1 41.7	87
29	2 8 49.29	9 9.18		12 54 19.3	56 15.9	9.28824	0.0565	3.29	4.66		88 1 42.4	88
30	2 13 29.33	13 49.43		13 21 29.7	23 25.9	9.28946	0.0515	3.32	4.68		89 1 43.2	89
31	2 18 10.18	18 30.48		13 48 20.9	50 16.5	9.29076	0.0462	3.33	4.70		90 1 43.9	90
Apr. 1	2 22 51.89	23 12.38		14 14 52.0	16 46.8	9.29210	0.0406	3.34	4.71		91 1 44.6	91
2	2 27 34.48	27 55.20		14 41 23.3	42 56.5	9.29347	0.0347	3.35	4.72		92 1 45.5	92
3	2 32 17.97	32 38.93		15 6 51.2	8 44.7	9.29487	0.0287	3.35	4.73		93 1 46.3	93
4	2 37 2.38	37 23.57		15 32 18.2	34 10.8	9.29630	0.0223	3.36	4.75		94 1 47.1	94
5	2 41 47.74	42 9.16		15 57 22.5	59 14.3	9.29776	0.0157	3.36	4.75		95 1 47.9	95
6	2 46 34.06	46 55.71		16 22 33.5	23 54.1	9.29920	0.0086	3.37	4.76		96 1 48.7	96
7	2 51 21.34	51 43.24		16 46 19.6	48 9.4	9.30070	0.0012	3.37	4.78		97 1 49.6	97
8	2 56 9.61	56 31.75		17 10 10.6	11 59.3	9.30219	9.9935	3.39	4.81		98 1 50.4	98
9	3 0 58.89	1 21.29		17 33 35.9	35 23.4	9.30372	9.9854	3.39	4.81		99 1 51.3	99
10	3 5 49.19	6 11.85		17 56 34.8	58 21.1	9.30525	9.9770	3.39	4.82		100 1 52.2	100
11	3 10 40.51	11 3.44		18 19 6.6	20 51.6	9.30677	9.9682	3.40	4.83		101 1 53.1	101
12	3 15 32.86	15 56.07		18 41 10.7	42 54.4	9.30833	9.9590	3.38	4.85		102 1 54.1	102
13	3 20 26.25	20 49.72		19 2 46.3	4 28.5	9.30982	9.9492	3.39	4.86		103 1 55.0	103
14	3 25 20.65	25 44.41		19 23 52.3	25 33.0	9.31134	9.9390	3.39	4.87		104 1 56.0	104
15	3 30 16.8	30 40.11		19 44 28.2	46 7.2	9.31286	9.9283	3.38	4.87		105 1 56.9	105
16	3 35 12.53	35 36.84		20 4 33.5	6 10.8	9.31434	9.9173	3.38	4.89		106 1 57.9	106
17	3 40 9.99	40 34.59		20 24 7.7	25 43.2	9.31583	9.9055	3.36	4.90		107 1 58.9	107
18	3 45 8.46	45 33.35		20 43 9.9	44 43.6	9.31725	9.8932	3.36	4.90		108 1 59.9	108
19	3 50 7.90	50 33.08		21 1 39.4	3 11.2	9.31867	9.8803	3.36	4.91		109 2 0.9	109
20	3 55 8.31	55 33.80		21 19 35.6	21 5.3	9.32005	9.8667	3.35	4.92		110 2 2.0	110
21	4 0 9.66	0 35.46		21 36 57.8	38 25.3	9.32140	9.8524	3.32	4.93		111 2 3.1	111
22	4 5 11.93	5 38.04		21 53 45.4	55 10.7	9.32267	9.8374	3.32	4.94		112 2 4.2	112
23	4 10 15.07	10 41.49		22 9 57.9	11 20.9	9.32391	9.8216	3.31	4.94		113 2 5.3	113
24	4 15 19.07	15 45.79		22 26 34.8	26 55.4	9.32514	9.8050	3.28	4.95		114 2 6.4	114
25	4 20 23.91	20 59.95		22 40 35.5	41 53.6	9.32630	9.7874	3.26	4.95		115 2 7.6	115
26	4 25 29.54	25 56.91		22 54 59.4	56 14.9	9.32740	9.7687	3.23	4.95		116 2 8.8	116
27	4 30 35.93	31 3.63		23 8 45.9	9 58.7	9.32847	9.7490	3.20	4.96		117 2 10.0	117
28	4 35 43.04	36 11.03		23 21 54.7	23 4.6	9.32944	9.7281	3.19	4.97		118 2 11.1	118
29	4 40 50.82	41 19.11		23 34 25.3	35 32.3	9.33036	9.7057	3.16	4.97		119 2 12.3	119
30	4 45 59.24	46 27.84		23 46 17.1	47 21.1	9.33124	9.6821	3.10	4.97		120 2 13.4	120
31	4 51 8.26	51 37.14	+23	57 29.8	58 30.5	+9.33203	+9.6566	+3.06	-4.98		121 2 14.4	121

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.			Apparent Declination.			Log Factor 1.		Log Factor 2.		Mean Solar Time of Meridian Transit.			Sidereal Date of Transit.				
	At Mean Noon.		At Transit.	At Mean Noon.		At Transit.	In R.A.	In Dec.	In R.A.	In Dec.								
d	h	m	s	m	s	°	'	"					d	h	m	s		
May 1	4	51	8.26	51	37.14	+23	57	29.8	58	30.5	+9.33203	+9.6566	+3.06	-4.98	121	2	14.4	121
2	4	56	17.81	56	47.00	24	8	2.9	9	0.5	9.33274	9.6299	3.03	4.99	122	2	15.7	122
3	5	1	27.84	1	57.34	24	17	56.2	18	50.5	9.33339	9.6001	2.99	4.99	123	2	16.9	123
4	5	6	38.32	7	8.13	24	27	9.3	28	0.2	9.33399	9.5684	2.91	5.00	124	2	18.2	124
5	5	11	49.20	12	19.31	24	36	41.8	36	29.2	9.33451	9.5336	2.86	5.00	125	2	19.4	125
6	5	17	0.43	17	30.87	24	43	33.3	44	17.2	9.33498	9.4958	2.76	5.00	126	2	20.8	126
7	5	22	11.97	22	42.73	24	50	43.7	51	24.0	9.33536	9.4544	2.64	5.01	127	2	22.1	127
8	5	27	23.75	27	54.81	24	57	12.8	57	49.3	9.33568	9.4077	2.54	5.01	128	2	23.4	128
9	5	32	35.72	33	7.06	25	3	0.1	3	32.7	9.33586	9.3554	1.99	5.01	129	2	24.6	129
10	5	37	47.78	38	19.40	25	8	5.6	8	34.2	9.33598	9.2959	+1.38	5.01	130	2	25.9	130
11	5	42	59.87	43	31.78	25	12	20.2	12	53.8	9.33598	9.2267	-2.20	5.01	131	2	27.2	131
12	5	48	11.98	48	44.14	25	16	10.8	16	31.3	9.33592	9.1437	2.46	5.01	132	2	28.4	132
13	5	53	24.01	53	56.44	25	19	10.2	19	26.4	9.33579	9.0409	2.68	5.01	133	2	29.7	133
14	5	58	35.91	59	8.59	25	21	27.3	21	30.3	9.33556	8.9061	2.83	5.01	134	2	30.9	134
15	6	3	47.60	4	20.53	25	23	2.2	23	9.8	9.33521	8.7085	2.91	5.01	135	2	32.2	135
16	6	8	59.01	9	32.17	25	23	54.8	23	58.0	9.33478	+8.3400	2.99	5.01	136	2	33.4	136
17	6	14	10.08	14	43.46	25	24	5.3	24	4.0	9.33427	-7.8678	3.06	5.01	137	2	34.6	137
18	6	19	20.75	19	54.36	25	23	33.7	23	27.8	9.33366	8.5626	3.13	5.01	138	2	35.9	138
19	6	24	30.94	25	4.78	25	22	20.1	22	9.6	9.33292	8.8180	3.18	5.01	139	2	37.2	139
20	6	29	40.57	30	14.60	25	20	24.5	20	9.3	9.33208	8.9774	3.21	5.00	140	2	38.4	140
21	6	34	44.57	35	23.78	25	17	47.1	17	27.1	9.33116	9.0926	3.26	5.00	141	2	39.6	141
22	6	39	57.88	40	32.26	25	14	28.3	14	3.6	9.33012	9.1831	3.30	5.00	142	2	40.8	142
23	6	45	5.42	45	39.98	25	10	28.3	9	58.8	9.32900	9.2578	3.33	4.99	143	2	42.0	143
24	6	50	12.14	50	46.85	25	5	47.3	5	12.9	9.32780	9.3211	3.36	4.99	144	2	43.1	144
25	6	55	17.98	55	52.82	25	0	25.6	59	46.4	9.32649	9.3755	3.39	4.99	145	2	44.3	145
26	7	0	22.86	0	57.83	24	54	23.6	53	39.5	9.32508	9.4240	3.42	4.98	146	2	45.5	146
27	7	5	26.71	6	1.80	24	47	41.4	46	52.3	9.32356	9.4676	3.44	4.97	147	2	46.6	147
28	7	10	29.46	11	4.65	24	40	19.3	39	25.3	9.32193	9.5062	3.44	4.96	148	2	47.6	148
29	7	15	31.05	16	6.31	24	32	18.1	31	19.2	9.32024	9.5411	3.47	4.96	149	2	48.6	149
30	7	20	31.45	21	6.77	24	23	38.3	22	34.5	9.31847	9.5734	3.50	4.96	150	2	49.7	150
June 1	7	25	30.61	26	5.99	24	14	20.1	13	11.3	9.31661	9.6032	3.52	4.96	151	2	50.8	151
2	7	30	28.46	31	3.91	24	4	23.9	3	10.2	9.31467	9.6307	3.54	4.95	152	2	51.8	152
3	7	35	24.96	36	0.45	23	53	50.2	52	31.6	9.31265	9.6562	3.54	4.95	153	2	52.8	153
4	7	40	20.06	40	55.58	23	42	39.6	41	16.1	9.31057	9.6800	3.55	4.94	154	2	53.8	154
5	7	45	13.73	45	49.26	23	30	52.5	29	24.2	9.30844	9.7022	3.56	4.93	155	2	54.7	155
6	7	50	5.94	50	41.47	23	18	29.5	16	56.4	9.30622	9.7229	3.58	4.92	156	2	55.7	156
7	7	54	56.62	55	32.16	23	5	31.3	3	53.4	9.30390	9.7426	3.58	4.91	157	2	56.6	157
8	7	59	45.73	60	21.26	22	51	58.3	50	15.7	9.30150	9.7609	3.59	4.91	158	2	57.4	158
9	8	4	33.24	5	8.74	22	37	51.2	36	3.9	9.29908	9.7784	3.60	4.90	159	2	58.3	159
10	8	9	19.14	9	54.59	22	23	10.4	21	18.6	9.29663	9.7947	3.61	4.89	160	2	59.1	160
11	8	14	3.41	14	38.80	22	7	56.8	6	0.3	9.29410	9.8102	3.62	4.88	161	3	0.0	161
12	8	18	45.99	19	21.31	21	52	10.9	50	9.9	9.29147	9.8249	3.62	4.87	162	3	0.6	162
13	8	23	26.85	24	2.09	21	35	53.3	33	48.0	9.28878	9.8388	3.62	4.86	163	3	1.3	163
14	8	28	5.97	28	41.13	21	19	4.7	16	55.1	9.28607	9.8520	3.63	4.85	164	3	2.0	164
15	8	32	43.34	33	18.41	21	1	45.9	59	32.0	9.28331	9.8644	3.64	4.84	165	3	2.7	165
16	8	37	18.93	37	53.91	20	43	57.6	41	39.5	9.28048	9.8763	3.64	4.83	166	3	3.4	166
17	8	41	52.70	42	27.55	20	25	40.4	23	18.1	9.27755	9.8877	3.64	4.81	167	3	4.0	167
18	8	46	24.62	46	59.34	20	6	54.9	4	28.7	9.27463	9.8984	3.65	4.80	168	3	4.5	168
19	8	50	54.70	51	29.29	19	47	41.9	45	11.7	9.27163	9.9086	3.65	4.79	169	3	5.1	169
20	8	55	22.91	55	57.35	19	28	2.2	25	28.2	9.26862	9.9183	3.66	4.78	170	3	5.6	170
21	8	59	49.24	60	23.53	19	7	56.6	5	18.8	9.26551	9.9275	3.68	4.77	171	3	6.2	171
22	9	4	13.65	4	47.77	18	47	25.8	44	44.4	9.26231	9.9363	3.67	4.76	172	3	6.6	172
23	9	8	36.11	9	10.05	18	26	30.5	23	45.7	9.25911	9.9446	3.68	4.73	173	3	7.0	173
24	9	12	56.64	13	30.40	18	5	11.5	2	23.4	9.25586	9.9525	3.68	4.73	174	3	7.4	174
25	9	17	15.21	17	48.79	17	43	29.7	40	38.2	9.25259	9.9600	3.68	4.71	175	3	7.8	175
26	9	21	31.82	22	5.19	17	21	25.6	18	31.0	9.24923	9.9672	3.68	4.69	176	3	8.1	176
27	9	25	46.45	26	19.59	16	59	0.0	56	2.4	9.24584	9.9740	3.68	4.68	177	3	8.3	177
28	9	29	59.09	30	32.03	16	36	13.7	33	13.2	9.24245	9.9805	3.68	4.66	178	3	8.6	178
29	9	34	9.76	34	42.47	16	13	7.3	10	4.0	9.23897	9.9867	3.68	4.64	179	3	8.8	179
30	9	38	18.41	38	50.91	15	49	41.7	46	35.8	9.23547	9.9924	3.68	4.62	180	3	9.1	180
31	9	42	25.06	42	57.34	15	25	57.8	22	49.3	9.23199	9.9979	3.68	4.61	181	3	9.3	181
31	9	46	29.73	47	1.76	+15	1	56.2	58	45.3	+9.22841	-0.0032	-3.68	-4.59	182	3	9.4	182

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right A-cension.				Apparent Declination.				Log Factor <i>t</i> .		Log Factor <i>t'</i> .		Mean Solar Time of Meridian Transit.	Side-real Date of Transit.					
	At Mean Noon.		At Transit.		At Mean Noon.		At Transit.		In R.A.	In Dec.	In R.A.	In Dec.							
July	d	h	m	s	m	s	°	'	"					d	h	m	d		
	1	9	46	20.73	47	1.76	+15	0	56.2	58	45.3	+9.22841	-0.0032	-3.68	-4.59	182	3	9.4	182
	2	9	50	32.38	51	4.16	14	37	37.4	34	24.2	9.22483	0.0081	3.68	4.59	183	3	9.5	183
	3	9	54	33.03	55	4.56	14	13	2.3	9	46.9	9.22118	0.0129	3.68	4.56	184	3	9.6	184
	4	9	58	31.66	59	2.95	13	48	11.4	44	53.9	9.21754	0.0173	3.68	4.53	185	3	9.7	185
	5	10	2	28.28	2	59.30	13	23	5.7	19	46.2	9.21382	0.0216	3.68	4.51	186	3	9.7	186
	6	10	6	22.88	6	53.62	12	57	45.7	54	24.5	9.21011	0.0255	3.68	4.48	187	3	9.6	187
	7	10	10	15.48	10	45.94	12	32	12.2	28	49.4	9.20638	0.0292	3.68	4.46	188	3	9.5	188
	8	10	14	6.07	14	36.25	12	6	26.1	3	1.8	9.20256	0.0326	3.68	4.44	189	3	9.4	189
	9	10	17	54.64	18	24.54	11	40	28.1	37	2.4	9.19876	0.0359	3.68	4.41	190	3	9.3	190
	10	10	21	41.21	22	10.83	11	14	18.8	10	51.8	9.19492	0.0389	3.68	4.38	191	3	9.2	191
	11	10	25	25.77	25	55.08	10	47	58.8	44	30.7	9.19101	0.0418	3.68	4.33	192	3	8.9	192
	12	10	29	8.30	29	37.31	10	21	28.8	17	59.7	9.18701	0.0444	3.68	4.31	193	3	8.7	193
	13	10	32	48.78	33	17.51	9	54	49.7	51	19.5	9.18304	0.0468	3.69	4.26	194	3	8.6	194
	14	10	36	27.23	36	55.61	9	28	2.1	24	31.3	9.17894	0.0490	3.69	4.21	195	3	8.1	195
	15	10	40	3.62	40	31.67	9	1	6.8	57	35.6	9.17481	0.0509	3.69	4.16	196	3	7.7	196
	16	10	43	37.94	44	5.66	8	34	4.7	30	33.3	9.17067	0.0526	3.71	4.11	197	3	7.3	197
	17	10	47	10.17	47	37.56	8	6	56.5	3	24.8	9.16631	0.0542	3.71	4.04	198	3	6.9	198
	18	10	50	40.30	51	7.36	7	39	42.8	36	10.8	9.16195	0.0556	3.71	3.95	199	3	6.5	199
	19	10	54	8.30	54	35.02	7	12	24.4	8	52.4	9.15748	0.0566	3.71	3.86	200	3	6.1	200
	20	10	57	34.14	58	0.50	6	45	2.4	41	30.4	9.15282	0.0575	3.72	3.77	201	3	5.6	201
	21	11	0	57.78	1	23.78	6	17	37.3	14	5.6	9.14812	0.0586	3.73	3.53	202	3	5.0	202
	22	11	4	19.21	4	44.84	5	50	9.9	46	38.8	9.14335	0.0588	3.74	-3.16	203	3	4.4	203
	23	11	7	38.39	8	3.65	5	22	41.0	19	10.5	9.13841	0.0590	3.74		204	3	3.8	204
	24	11	10	55.28	11	20.16	4	55	11.5	51	41.6	9.13332	0.0591	3.75	+3.16	205	3	3.2	205
	25	11	14	9.84	14	34.33	4	27	42.0	24	12.9	9.12810	0.0591	3.76	3.59	206	3	2.5	206
	26	11	17	22.04	17	46.11	4	0	13.1	56	45.2	9.12270	0.0587	3.78	3.73	207	3	1.6	207
	27	11	20	31.82	20	55.48	3	32	45.8	29	19.0	9.11709	0.0582	3.77	3.88	208	3	0.8	208
	28	11	23	30.14	24	2.39	3	5	20.8	1	55.3	9.11139	0.0577	3.77	3.99	209	3	0.0	209
	29	11	26	43.98	27	6.81	2	37	59.0	34	34.9	9.10549	0.0567	3.79	4.03	210	2	59.2	210
	30	11	29	46.28	30	8.68	2	10	41.2	7	18.6	9.09939	0.0554	3.81	4.10	211	2	58.3	211
Aug.	1	11	32	45.99	33	7.94	1	43	27.9	40	7.1	9.09306	0.0541	3.81	4.18	212	2	57.3	212
	2	11	35	43.05	36	4.55	1	16	20.1	13	1.3	9.08649	0.0525	3.82	4.22	213	2	56.3	213
	3	11	38	37.39	38	58.42	0	49	18.7	46	1.9	9.07963	0.0507	3.83	4.29	214	2	55.2	214
	4	11	41	23.95	41	49.51	+0	22	24.4	19	9.8	9.07255	0.0487	3.84	4.33	215	2	54.1	215
	5	11	44	17.68	44	37.76	-0	4	21.9	7	34.3	9.06517	0.0464	3.86	4.36	216	2	53.0	216
	6	11	47	3.51	47	23.09	0	30	29.4	34	9.4	9.05751	0.0439	3.87	4.39	217	2	51.7	217
	7	11	49	46.37	50	5.45	0	57	27.4	0	34.7	9.04948	0.0412	3.88	4.44	218	2	50.4	218
	8	11	52	26.17	52	44.75	1	23	45.1	26	49.6	9.04107	0.0382	3.89	4.48	219	2	49.2	219
	9	11	55	2.83	55	21.90	1	49	51.3	52	53.2	9.03222	0.0349	3.91	4.50	220	2	48.0	220
	10	11	57	36.25	57	53.79	2	15	45.1	18	44.2	9.02283	0.0313	3.92	4.53	221	2	46.6	221
	11	12	0	6.30	0	23.30	2	41	25.6	44	21.4	9.01299	0.0274	3.93	4.56	222	2	45.1	222
	12	12	2	32.90	2	49.33	3	6	51.7	9	44.1	9.00271	0.0231	3.95	4.59	223	2	43.5	223
	13	12	4	55.96	5	11.82	3	32	2.3	34	51.2	8.99173	0.0186	3.96	4.63	224	2	41.9	224
	14	12	7	15.33	7	30.63	3	56	56.4	59	41.8	8.98001	0.0136	3.98	4.66	225	2	40.4	225
	15	12	9	30.87	9	45.60	4	21	32.9	24	14.7	8.96754	0.0083	3.99	4.68	226	2	38.9	226
	16	12	11	42.45	11	56.57	4	45	50.5	48	28.4	8.95426	0.0025	4.01	4.71	227	2	37.1	227
	17	12	13	49.93	14	3.41	5	9	48.0	12	21.7	8.94002	0.9962	4.02	4.73	228	2	35.1	228
	18	12	15	53.14	16	6.01	5	33	24.1	35	53.5	8.92471	9.9894	4.04	4.76	229	2	33.3	229
	19	12	17	51.92	18	4.15	5	56	37.4	59	2.6	8.90819	9.9821	4.06	4.78	230	2	31.4	230
	20	12	19	46.09	19	57.67	6	19	26.6	21	47.3	8.89031	9.9743	4.07	4.80	231	2	29.4	231
	21	12	21	35.47	21	46.39	6	41	50.3	44	6.3	8.87098	9.9658	4.09	4.83	232	2	27.4	232
	22	12	23	19.88	23	30.11	7	3	46.9	5	57.9	8.84992	9.9566	4.11	4.86	233	2	25.0	233
	23	12	24	59.13	25	8.69	7	25	14.8	27	20.7	8.82696	9.9466	4.13	4.89	234	2	22.7	234
	24	12	26	33.03	26	41.89	7	46	12.2	48	13.0	8.80176	9.9358	4.14	4.91	235	2	20.3	235
	25	12	28	1.37	28	9.53	8	6	37.4	8	33.0	8.77386	9.9241	4.16	4.94	236	2	17.9	236
	26	12	29	23.93	29	31.38	8	26	28.7	28	18.8	8.74293	9.9115	4.17	4.96	237	2	15.2	237
	27	12	30	40.52	30	47.26	8	45	44.3	47	28.7	8.70848	9.8977	4.19	4.99	238	2	12.5	238
	28	12	31	50.92	31	56.95	9	4	22.1	6	0.8	8.66971	9.8826	4.20	5.01	239	2	9.6	239
	29	12	32	54.92	33	0.24	9	22	20.0	23	53.0	8.62556	9.8660	4.22	5.03	240	2	6.8	240
	30	12	33	52.32	33	56.95	9	39	35.9	41	3.1	8.57479	9.8482	4.23	5.05	241	2	4.0	241
	31	12	34	42.92	34	46.86	9	56	7.9	57	29.1	8.51549	9.8284	4.24	5.07	242	2	0.9	242
31	12	35	26.52	35	29.78	-10	11	53.6	13	8.7	+8.44489	-9.8067	-4.25	+5.09	243	1	57.6	243	

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.		Apparent Declination.		Log Factor 1.		Log Factor 2.		Mean Solar Time of Meridian Transit.	Side- real Date of Transit.		
	At Mean Noon.	At Transit.	At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.				
Sept.	d	h m s	m s	° ' "					d	h m	d	
	1	12 36 2.93	36 5.52	-10 26 50.7	27 59.7	+8.35818	-9.7826	-4.26	+5.11	244	1 54.3	244
	2	12 36 31.99	36 33.92	10 40 56.7	41 59.7	8.24528	9.7556	4.26	5.13	245	1 50.9	245
	3	12 36 53.47	36 54.78	10 54 8.9	55 5.9	8.08961	9.7256	4.27	5.15	246	1 47.3	246
	4	12 37 7.24	37 7.93	11 6 25.0	7 15.7	7.83728	9.6918	4.28	5.17	247	1 43.5	247
	5	12 37 13.15	37 13.27	11 17 42.3	18 26.8	+7.13831	9.6530	4.29	5.19	248	1 39.5	248
	6	12 37 11.08	37 10.66	11 27 57.8	28 36.4	-7.62554	9.6084	4.29	5.20	249	1 35.6	249
	7	12 37 0.90	36 59.98	11 37 8.8	37 41.7	7.99515	9.5565	4.30	5.22	250	1 31.5	250
	8	12 36 42.52	36 41.14	11 45 12.7	45 40.0	8.19324	9.4955	4.30	5.24	251	1 27.4	251
	9	12 36 15.89	36 14.10	11 52 7.1	52 28.9	8.33047	9.4207	4.30	5.26	252	1 23.0	252
	10	12 35 40.94	35 38.81	11 57 48.9	58 5.4	8.43393	9.3267	4.29	5.28	253	1 18.3	253
	11	12 34 57.73	34 55.30	12 2 15.4	2 27.0	8.51705	9.2007	4.28	5.29	254	1 13.5	254
	12	12 34 6.31	34 3.65	12 5 23.8	5 30.9	8.58640	9.0154	4.27	5.30	255	1 8.8	255
	13	12 33 6.77	33 3.94	12 7 11.8	7 14.7	8.64530	-8.6716	4.26	5.31	256	1 4.1	256
	14	12 31 59.27	31 56.34	12 7 37.3	7 36.6	8.69595	+8.0375	4.25	5.32	257	0 59.0	257
	15	12 30 44.02	30 41.07	12 6 38.6	6 34.8	8.74015	8.8464	4.24	5.32	258	0 53.6	258
	16	12 29 21.26	29 18.36	12 4 13.9	4 7.6	8.77901	9.1158	4.22	5.33	259	0 48.3	259
	17	12 27 51.30	27 48.51	12 0 21.9	0 13.8	8.81287	9.2824	4.18	5.33	260	0 43.0	260
	18	12 26 14.55	26 11.93	11 55 1.9	54 52.5	8.84242	9.4032	4.14	5.33	261	0 37.7	261
	19	12 24 31.48	24 29.11	11 48 13.7	48 3.7	8.86797	9.4773	4.13	5.32	262	0 32.1	262
	20	12 22 42.63	22 40.59	11 39 58.0	39 48.0	8.88967	9.5739	4.05	5.32	263	0 26.3	263
	21	12 20 48.57	20 46.92	11 30 15.5	30 6.5	8.90879	9.6384	3.96	5.31	264	0 20.5	264
	22	12 18 49.93	18 48.71	11 19 7.6	19 0.5	8.92435	9.6937	3.86	5.29	265	0 14.5	265
	23	12 16 47.45	16 46.70	11 6 36.5	6 32.0	8.93636	9.7410	3.72	5.26	266	0 8.5	266
	24	12 14 41.97	14 41.72	10 52 45.8	52 44.2	8.94543	9.7814	3.54	5.23	267	0 2.5	267
	25	12 12 34.27	12 34.58	10 37 40.0	37 41.8	8.95146	9.8163	-3.20	5.20	267	23 56.5	268
	26	12 10 25.18	10 26.08	10 21 23.4	21 29.9	8.95475	9.8471	+2.99	5.16	268	23 50.4	269
	27	12 8 15.63	8 17.06	10 4 1.0	4 12.8	8.95485	9.8733	3.48	5.11	269	23 44.3	270
	28	12 6 6.48	6 8.42	9 45 39.0	45 56.3	8.95210	9.8965	3.71	5.05	270	23 38.3	271
	29	12 3 58.60	4 1.05	9 26 24.2	26 46.9	8.94616	9.9140	3.87	4.96	271	23 32.3	272
	30	12 1 52.89	1 55.81	9 6 23.7	6 52.2	8.93723	9.9292	3.96	4.87	272	23 26.2	273
	Oct.	1	11 59 50.18	59 53.52	8 45 44.7	46 19.4	8.92511	9.9415	4.04	4.73	273	23 20.3
2		11 57 51.30	57 55.00	8 24 34.7	25 15.4	8.90960	9.9507	4.11	4.56	274	23 14.4	275
3		11 55 57.05	56 1.04	8 3 1.7	3 48.3	8.89041	9.9577	4.17	+4.25	275	23 8.6	276
4		11 54 8.18	54 12.38	7 41 13.6	42 5.9	8.86756	9.9607	4.20	-2.68	276	23 2.8	277
5		11 52 25.33	52 29.67	7 19 18.2	20 15.6	8.84081	9.9619	4.24	4.25	277	22 57.3	278
6		11 50 49.08	50 53.48	6 57 23.0	58 25.2	8.80967	9.9666	4.26	4.55	278	22 51.8	279
7		11 49 19.98	49 24.35	6 35 35.3	36 41.8	8.77356	9.9568	4.28	4.70	279	22 46.5	280
8		11 47 58.49	48 2.74	6 14 2.2	15 12.6	8.73178	9.9508	4.30	4.81	280	22 41.2	281
9		11 46 45.00	46 49.06	5 52 49.9	54 3.6	8.68331	9.9426	4.31	4.89	281	22 35.9	282
10		11 45 39.83	45 43.61	5 32 4.5	33 20.7	8.62676	9.9321	4.32	4.16	282	22 31.0	283
11		11 44 43.23	44 46.65	5 11 51.6	13 9.5	8.56039	9.9195	4.33	5.01	283	22 26.4	284
12		11 43 55.38	43 58.37	4 52 16.4	53 35.4	8.47973	9.9046	4.34	5.05	284	22 21.7	285
13		11 43 16.44	43 18.93	4 33 23.5	34 43.1	8.37858	9.8876	4.34	5.07	285	22 17.0	286
14		11 42 46.54	42 48.45	4 15 16.8	16 36.4	8.24528	9.8684	4.34	5.10	286	22 12.2	287
15		11 42 25.70	42 26.98	3 57 59.8	59 18.8	8.05542	9.8467	4.34	5.12	287	22 7.7	288
16		11 42 13.84	42 14.48	3 41 35.8	42 53.5	-7.70615	9.8226	4.33	5.14	288	22 3.4	289
17		11 42 10.98	42 10.89	3 26 7.3	27 23.0	+7.06436	9.7962	4.33	5.16	289	21 59.3	290
18		11 42 17.05	42 16.17	3 11 36.1	12 49.2	7.86489	9.7673	4.32	5.16	290	21 55.4	291
19		11 42 31.93	42 30.24	2 58 3.7	59 13.5	8.12675	9.7353	4.32	5.17	291	21 52.0	292
20		11 42 55.48	42 52.97	2 45 31.8	46 37.8	8.28724	9.6997	4.31	5.17	292	21 48.6	293
21		11 43 27.57	43 24.21	2 34 1.7	35 3.6	8.40250	9.6605	4.29	5.17	293	21 45.3	294
22		11 44 8.04	44 3.80	2 23 33.9	24 31.4	8.49175	9.6173	4.28	5.17	294	21 42.0	295
23		11 44 56.69	44 51.56	2 14 8.6	15 1.3	8.56386	9.5692	4.26	5.17	295	21 38.8	296
24		11 45 53.29	45 47.27	2 5 45.8	6 33.3	8.62375	9.5150	4.26	5.17	296	21 35.9	297
25		11 46 57.60	46 50.69	1 58 25.4	59 7.4	8.67530	9.4535	4.25	5.17	297	21 33.3	298
26		11 48 9.44	48 1.63	1 52 7.0	52 43.3	8.72033	9.3825	4.24	5.16	298	21 30.4	299
27		11 49 28.61	49 19.89	1 46 50.1	47 20.6	8.75993	9.2979	4.22	5.16	299	21 27.7	300
28		11 50 54.80	50 45.26	1 42 34.2	42 58.7	8.79501	9.1942	4.20	5.15	300	21 25.1	301
29		11 52 23.01	52 17.50	1 39 18.4	39 36.7	8.82635	9.0615	4.19	5.15	301	21 22.6	302
30		11 54 7.74	53 56.35	1 37 1.4	37 13.6	8.85462	8.8731	4.17	5.14	302	21 20.3	303
31		11 55 53.85	55 41.61	1 35 42.3	35 48.3	8.88026	+8.5397	4.15	5.13	303	21 18.2	304
32		11 57 46.11	57 33.02	1 35 20.1	35 19.8	+8.90362	-7.6340	+4.14	-5.12	304	21 16.1	305

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right A-cension.		Apparent Declination.		Log Factor 1.		Log Factor 1 ² .		Mean Solar Time of Meridian Transit.	Side- real Date of Transit.			
	At Mean Noon.	At Transit.	At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.					
Nov. 1	h	m	°	'	°	'			d	h	m	s	
1	11 57	46.11	57 33.02	-1 35 20.1	35 19.8	+8.90362	-7.6340	+4.14	-5.12	304	21	16.1	365
2	11 59	44.29	59 30.37	1 35 53.3	35 46.6	8.92495	8.6263	4.12	5.10	305	21	14.1	366
3	12 1	48.16	1 33.44	1 37 20.5	37 7.5	8.94449	8.9000	4.11	5.09	306	21	12.3	367
4	12 3	57.50	3 42.00	1 39 40.4	39 21.1	8.96244	9.0623	4.09	5.08	307	21	10.6	368
5	12 6	12.08	5 55.82	1 42 51.4	42 26.0	8.97886	9.1769	4.07	5.07	308	21	8.9	369
6	12 8	31.68	8 14.68	1 46 52.0	46 20.6	8.99423	9.2659	4.05	5.06	309	21	7.3	370
7	12 10	56.10	10 38.36	1 51 41.0	51 3.4	9.00847	9.3376	4.03	5.04	310	21	5.7	371
8	12 13	25.15	13 6.69	1 57 16.8	56 33.1	9.02162	9.3677	4.01	5.03	311	21	4.1	372
9	12 15	58.64	15 39.50	2 3 37.7	2 48.3	9.03393	9.4475	3.99	5.01	312	21	2.7	373
10	12 18	36.40	18 16.61	2 10 42.4	9 47.3	9.04547	9.4917	3.97	5.00	313	21	1.5	374
11	12 21	18.25	20 57.82	2 18 29.6	17 28.9	9.05619	9.5304	3.96	4.98	314	21	0.2	375
12	12 24	4.01	23 42.97	2 26 57.8	25 51.7	9.06617	9.5649	3.94	4.96	315	20	59.1	376
13	12 26	53.51	26 31.87	2 36 5.6	34 54.2	9.07553	9.5958	3.92	4.94	316	20	57.9	377
14	12 29	46.61	29 24.39	2 45 51.5	44 34.9	9.08448	9.6232	3.91	4.93	317	20	56.8	378
15	12 32	43.21	32 20.42	2 56 13.9	54 52.3	9.09291	9.6484	3.89	4.91	318	20	56.0	379
16	12 35	43.17	35 19.84	3 7 11.7	5 45.2	9.10085	9.6713	3.87	4.90	319	20	55.0	380
17	12 38	46.36	38 22.51	3 18 43.6	17 12.3	9.10834	9.6922	3.86	4.87	320	20	54.0	381
18	12 41	52.66	41 28.2	3 31 48.1	29 12.2	9.11547	9.7113	3.85	4.86	321	20	53.0	382
19	12 45	1.97	44 37.10	3 43 23.9	41 43.5	9.12226	9.7289	3.83	4.85	322	20	52.2	383
20	12 48	14.19	47 48.85	3 56 29.7	54 45.0	9.12866	9.7452	3.82	4.82	323	20	51.4	384
21	12 51	29.21	51 3.41	4 10 4.3	8 15.6	9.13485	9.7603	3.81	4.80	324	20	50.7	385
22	12 54	46.97	54 20.73	4 24 6.6	22 13.9	9.14078	9.7742	3.80	4.78	325	20	50.1	386
23	12 58	7.39	57 40.72	4 38 35.3	36 38.8	9.14645	9.7870	3.77	4.76	326	20	49.5	387
24	13 1	30.39	1 3.31	4 53 28.9	51 28.9	9.15189	9.7989	3.76	4.73	327	20	49.0	388
25	13 4	55.90	4 28.42	5 8 46.4	6 43.0	9.15715	9.8098	3.74	4.71	328	20	48.5	389
26	13 8	23.86	7 55.99	5 24 26.5	22 19.8	9.16214	9.8201	3.74	4.69	329	20	48.0	390
27	13 11	54.19	11 25.94	5 40 28.2	38 18.3	9.16701	9.8295	3.73	4.66	330	20	47.5	391
28	13 15	26.84	14 58.22	5 56 50.2	54 37.4	9.17165	9.8382	3.72	4.62	331	20	47.1	392
29	13 19	1.74	18 32.78	6 13 31.2	11 15.7	9.17615	9.8462	3.71	4.60	332	20	46.8	393
30	13 22	38.84	22 9.54	6 30 30.0	28 12.0	9.18051	9.8536	3.69	4.56	333	20	46.5	394
Dec. 1	13 26	18.09	25 48.46	6 47 45.4	45 25.2	9.18469	9.8602	3.69	4.53	334	20	46.2	395
2	13 29	59.43	29 2.48	7 5 16.1	2 53.8	9.18876	9.8663	3.69	4.50	335	20	45.9	396
3	13 33	42.82	33 12.56	7 23 1.0	20 36.5	9.19270	9.8718	3.68	4.46	336	20	45.7	397
4	13 37	28.22	36 57.67	7 40 58.9	38 32.6	9.19654	9.8769	3.66	4.41	337	20	45.6	398
5	13 41	15.59	40 44.75	7 59 8.8	56 40.8	9.20025	9.8814	3.65	4.37	338	20	45.4	399
6	13 45	4.88	44 33.77	8 17 29.4	14 59.9	9.20386	9.8854	3.65	4.33	339	20	45.3	400
7	13 48	56.06	48 24.68	8 35 59.6	33 28.8	9.20737	9.8890	3.64	4.25	340	20	45.2	401
8	13 52	49.09	52 17.43	8 54 38.4	52 6.4	9.21075	9.8920	3.63	4.16	341	20	45.0	402
9	13 56	43.92	56 12.01	9 13 24.5	10 51.6	9.21405	9.8946	3.62	4.08	342	20	45.0	403
10	14 0	40.53	0 8.39	9 32 16.9	29 43.2	9.21730	9.8968	3.62	3.99	343	20	45.0	404
11	14 4	38.91	4 6.55	9 51 14.6	48 40.2	9.22048	9.8987	3.61	3.86	344	20	45.1	405
12	14 8	39.02	8 6.41	10 10 16.7	7 41.7	9.22363	9.9002	3.60	3.68	345	20	45.1	406
13	14 12	40.86	12 8.02	10 29 22.1	26 46.8	9.22672	9.9012	3.60	-3.37	346	20	45.1	407
14	14 16	44.40	16 11.35	10 48 29.6	45 54.2	9.22971	9.9017	3.60	+2.38	347	20	45.2	408
15	14 20	49.61	20 16.36	11 7 37.9	5 2.7	9.23266	9.9018	3.60	3.29	348	20	45.4	409
16	14 24	56.49	24 23.04	11 26 46.1	24 11.1	9.23562	9.9017	3.59	3.64	349	20	45.5	410
17	14 29	5.03	28 31.39	11 45 53.5	43 18.7	9.23845	9.9012	3.60	3.82	350	20	45.7	411
18	14 33	15.20	32 41.39	12 4 59.0	2 24.8	9.24131	9.9003	3.60	3.95	351	20	46.0	412
19	14 37	27.02	36 53.04	12 24 1.7	21 28.2	9.24416	9.8991	3.59	4.08	352	20	46.3	413
20	14 41	40.48	41 6.34	12 43 0.7	40 27.9	9.24694	9.8975	3.60	4.16	353	20	46.6	414
21	14 45	55.57	45 21.26	13 1 54.9	59 23.1	9.24976	9.8954	3.60	4.22	354	20	46.9	415
22	14 50	12.30	49 37.83	13 20 43.1	18 12.4	9.25247	9.8928	3.59	4.25	355	20	47.2	416
23	14 54	30.64	53 56.00	13 39 24.3	36 54.8	9.25519	9.8900	3.59	4.31	356	20	47.5	417
24	14 58	50.60	58 15.82	13 57 57.8	55 29.7	9.25793	9.8869	3.58	4.36	357	20	47.9	418
25	15 3	12.18	2 37.27	14 16 22.8	13 56.2	9.26057	9.8834	3.58	4.41	358	20	48.4	419
26	15 7	35.35	7 0.32	14 34 38.3	32 13.4	9.26316	9.8793	3.58	4.44	359	20	48.8	420
27	15 12	0.10	11 24.94	14 52 43.1	50 20.0	9.26582	9.8748	3.58	4.48	360	20	49.3	421
28	15 16	26.46	15 51.16	15 10 36.2	8 15.1	9.26843	9.8699	3.58	4.50	361	20	49.7	422
29	15 20	54.41	20 18.99	15 28 16.7	25 57.7	9.27096	9.8646	3.58	4.53	362	20	50.3	423
30	15 25	23.92	24 48.41	15 45 43.9	43 27.1	9.27349	9.8589	3.57	4.56	363	20	50.8	424
31	15 29	54.99	29 19.39	-16 2 56.9	0 42.4	+9.27597	-9.8527	+3.57	+4.59	364	20	51.4	425

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of <i>t</i> in Sidereal Minutes.		Log Coefficient of <i>t</i> ² .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Jan. 1 6 40.7	1	1 25 6.65	25 12.84	+ 9 43 47.1	44 27.6	+8.86506	+9.6869	+3.39	+3.56
2 6 38.6	2	1 26 52.65	26 59.03	9 55 27.4	56 9.4	8.86909	9.6877	3.38	3.50
3 6 36.4	3	1 28 39.65	28 46.22	10 7 9.7	7 52.7	8.87303	9.6866	3.37	3.42
4 6 34.3	4	1 30 27.64	30 34.39	10 18 53.4	19 37.4	8.87687	9.6894	3.36	3.30
5 6 32.2	5	1 32 16.58	32 23.51	10 30 38.1	31 23.1	8.88163	9.6900	3.34	+3.10
6 6 30.1	6	1 34 6.45	34 13.58	10 42 23.7	43 9.6	8.88434	9.6904	3.34	
7 6 28.0	7	1 35 57.24	36 4.58	10 54 9.9	54 56.7	8.88790	9.6907	3.33	
8 6 25.9	8	1 37 48.93	37 56.48	11 5 56.5	6 44.3	8.89135	9.6909	3.32	
9 6 23.8	9	1 39 41.50	39 49.26	11 17 43.3	18 32.1	8.89474	9.6911	3.31	
10 6 21.8	10	1 41 34.94	41 42.91	11 29 30.3	30 20.2	8.89806	9.6912	3.30	
11 6 19.8	11	1 43 29.25	43 37.43	11 41 17.5	42 8.3	8.90132	9.6912	3.30	
12 6 17.8	12	1 45 24.40	45 32.80	11 53 4.5	53 56.3	8.90452	9.6911	3.30	
13 6 15.8	13	1 47 20.39	47 29.01	12 4 51.4	5 44.0	8.90767	9.6910	3.29	-3.10
14 6 13.8	14	1 49 17.23	49 26.07	12 16 38.0	17 31.4	8.91077	9.6907	3.29	3.24
15 6 11.8	15	1 51 14.90	51 23.97	12 28 24.0	29 18.2	8.91381	9.6903	3.28	3.33
16 6 9.8	16	1 53 13.38	53 22.69	12 40 9.3	41 4.4	8.91680	9.6898	3.28	3.40
17 6 7.8	17	1 55 12.67	55 22.22	12 51 53.7	52 49.7	8.91977	9.6892	3.28	3.45
18 6 5.9	18	1 57 12.78	57 22.56	13 3 37.1	4 34.0	8.92261	9.6885	3.27	3.50
19 6 4.0	19	1 59 13.69	59 23.70	13 15 19.2	16 17.1	8.92542	9.6877	3.27	3.54
20 6 2.1	20	2 1 15.36	1 25.60	13 26 59.9	27 58.7	8.92818	9.6866	3.26	3.58
21 6 0.2	21	2 3 17.79	3 28.26	13 38 39.0	39 38.8	8.93087	9.6858	3.26	3.62
22 5 58.3	22	2 5 20.98	5 31.69	13 50 16.5	51 17.2	8.93352	9.6847	3.25	3.66
23 5 56.4	23	2 7 24.02	7 35.87	14 1 52.3	2 53.8	8.93611	9.6835	3.24	3.70
24 5 54.5	24	2 9 20.58	9 40.78	14 13 26.0	14 28.3	8.93864	9.6822	3.23	3.74
25 5 52.7	25	2 11 34.36	11 46.40	14 24 57.5	26 0.6	8.94111	9.6807	3.22	3.78
26 5 50.9	26	2 13 41.05	13 52.74	14 36 26.7	37 30.7	8.94352	9.6792	3.22	3.81
27 5 49.1	27	2 15 47.83	15 59.78	14 47 53.4	48 58.2	8.94587	9.6776	3.21	3.83
28 5 47.3	28	2 17 55.30	17 7.50	14 59 17.5	60 23.1	8.94819	9.6759	3.20	3.85
29 5 45.5	29	2 20 3.44	20 15.89	15 10 38.8	11 45.1	8.95045	9.6740	3.20	3.87
30 5 43.7	30	2 22 12.24	22 24.94	15 21 57.1	23 4.1	8.95266	9.6720	3.19	3.89
Feb. 31 5 41.9	31	2 24 21.70	24 34.65	15 33 12.1	34 19.9	8.95481	9.6700	3.19	3.91
1 5 40.1	32	2 26 31.79	26 45.00	15 44 23.9	45 32.4	8.95692	9.6678	3.19	3.93
2 5 38.3	33	2 28 42.50	28 55.97	15 55 32.4	56 41.6	8.95898	9.6656	3.18	3.95
3 5 36.6	34	2 30 53.83	30 67.56	16 6 37.2	7 47.0	8.96101	9.6632	3.18	3.96
4 5 34.9	35	2 33 5.77	33 19.77	16 17 38.3	18 48.6	8.96302	9.6607	3.17	3.97
5 5 33.2	36	2 35 18.32	35 32.60	16 28 35.5	29 46.3	8.96500	9.6581	3.17	3.99
6 5 31.5	37	2 37 31.48	37 46.03	16 39 28.9	40 40.2	8.96696	9.6554	3.16	4.01
7 5 29.8	38	2 39 45.24	40 0.06	16 50 18.1	51 30.0	8.96889	9.6526	3.16	4.03
8 5 28.1	39	2 41 59.58	42 14.67	17 1 3.0	2 15.5	8.97080	9.6497	3.15	4.04
9 5 26.4	40	2 44 14.51	44 29.88	17 11 43.6	12 56.5	8.97270	9.6467	3.14	4.05
10 5 24.7	41	2 46 30.04	46 45.69	17 22 19.7	23 33.0	8.97458	9.6436	3.14	4.06
11 5 23.0	42	2 48 46.15	48 62.08	17 32 51.2	34 4.9	8.97644	9.6404	3.14	4.07
12 5 21.3	43	2 51 2.83	51 19.05	17 43 17.9	44 32.1	8.97827	9.6371	3.14	4.08
13 5 19.7	44	2 53 20.09	53 36.60	17 53 39.8	54 54.4	8.98009	9.6337	3.13	4.09
14 5 18.1	45	2 55 37.92	55 54.73	18 3 56.8	5 11.8	8.98188	9.6302	3.13	4.10
15 5 16.4	46	2 57 56.32	58 13.42	18 14 8.7	15 24.1	8.98366	9.6265	3.13	4.11
16 5 14.8	47	3 0 35.20	0 52.60	18 24 15.4	25 31.1	8.98542	9.6228	3.12	4.12
17 5 13.2	48	3 2 34.83	2 52.52	18 34 16.8	35 32.8	8.98716	9.6189	3.12	4.13
18 5 11.6	49	3 4 54.92	5 12.91	18 44 12.7	45 20.0	8.98888	9.6149	3.12	4.14
19 5 10.0	50	3 7 15.55	7 33.84	18 54 3.0	55 19.6	8.99057	9.6107	3.11	4.15
20 5 8.5	51	3 9 36.72	9 55.31	19 3 47.6	5 4.4	8.99223	9.6064	3.11	4.16
21 5 6.9	52	3 11 58.43	12 17.32	19 13 26.3	14 43.2	8.99387	9.6019	3.10	4.17
22 5 5.3	53	3 14 20.68	14 39.87	19 22 59.0	24 16.0	8.99547	9.5973	3.09	4.18
23 5 4.8	54	3 16 43.44	17 2.94	19 32 25.3	33 42.6	8.99704	9.5925	3.08	4.19
24 5 2.3	55	3 19 6.71	19 26.05	19 41 45.8	43 3.0	8.99856	9.5876	3.07	4.19
25 5 0.7	56	3 21 30.46	21 50.57	19 50 59.7	52 17.1	9.00006	9.5826	3.07	4.20
26 4 59.2	57	3 23 54.70	24 15.12	20 0 7.1	1 24.5	9.00151	9.5774	3.06	4.21
27 4 57.7	58	3 26 19.43	26 40.16	20 9 8.0	10 25.3	9.00293	9.5721	3.05	4.22
28 4 56.2	59	3 28 44.64	29 5.68	20 18 2.3	19 19.5	9.00432	9.5666	3.05	4.23
29 4 54.7	60	3 31 10.31	31 31.67	20 26 49.8	28 6.8	9.00568	9.5610	3.04	4.23
30 4 53.2	61	3 33 36.43	33 58.11	20 35 30.2	36 47.1	9.00702	9.5551	3.04	4.24
31 4 51.7	62	3 36 3.00	36 25.00	+20 44 3.5	45 20.2	+9.00833	+9.5490	+3.03	-4.25

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. 1 4 54.7	60	3 31 10.31	31 31.67	+20 26 49.8	28 6.8	+9.00568	+9.5610	+3.04	-4.23
2 4 53.2	61	3 33 36.43	33 58.11	20 35 30.2	36 47.1	9.00702	9.5551	3.04	4.24
3 4 51.7	62	3 36 3.00	36 25.00	20 44 3.5	45 20.2	9.00833	9.5490	3.03	4.25
4 4 50.2	63	3 38 30.01	38 52.33	20 52 29.6	53 46.1	9.00962	9.5428	3.02	4.26
5 4 48.7	64	3 40 57.45	41 20.09	21 0 48.5	2 4.7	9.01091	9.5365	3.02	4.26
6 4 47.3	65	3 43 25.34	43 48.30	21 9 0.0	10 15.9	9.01218	9.5299	3.01	4.26
7 4 45.8	66	3 45 53.65	46 16.94	21 17 4.0	18 19.6	9.01345	9.5231	3.01	4.27
8 4 44.3	67	3 48 22.39	48 46.01	21 25 0.4	26 15.7	9.01470	9.5161	3.01	4.27
9 4 42.8	68	3 50 51.56	51 15.50	21 32 49.3	34 4.1	9.01592	9.5091	3.00	4.27
10 4 41.4	69	3 53 21.15	53 45.41	21 40 30.4	41 44.8	9.01712	9.5017	3.00	4.28
11 4 40.0	70	3 55 51.14	56 15.73	21 48 3.6	49 17.5	9.01832	9.4941	2.99	4.28
12 4 38.5	71	3 58 21.54	58 46.46	21 55 28.8	56 42.2	9.01950	9.4864	2.99	4.29
13 4 37.1	72	4 0 52.36	1 17.61	22 2 46.0	3 58.8	9.02067	9.4784	2.99	4.29
14 4 35.7	73	4 3 23.58	3 49.16	22 9 55.2	11 7.4	9.02182	9.4700	2.98	4.30
15 4 34.3	74	4 5 55.20	6 21.11	22 16 56.1	18 7.6	9.02296	9.4615	2.98	4.30
16 4 32.9	75	4 8 27.22	8 53.46	22 23 48.7	24 59.5	9.02408	9.4528	2.97	4.30
17 4 31.5	76	4 10 59.62	11 26.20	22 30 32.9	31 42.9	9.02518	9.4437	2.97	4.31
18 4 30.1	77	4 13 32.41	13 59.33	22 37 8.6	38 17.8	9.02625	9.4342	2.96	4.32
19 4 28.7	78	4 16 5.58	16 32.83	22 43 35.7	44 44.1	9.02731	9.4246	2.95	4.33
20 4 27.3	79	4 18 39.11	19 6.70	22 49 54.1	51 1.6	9.02834	9.4147	2.94	4.33
21 4 26.0	80	4 21 13.00	21 40.93	22 56 3.8	57 10.4	9.02936	9.4044	2.93	4.33
22 4 24.6	81	4 23 47.24	24 15.51	23 2 4.8	3 10.5	9.03034	9.3937	2.92	4.34
23 4 23.2	82	4 26 21.84	26 50.45	23 7 56.8	9 1.4	9.03129	9.3826	2.91	4.34
24 4 21.9	83	4 28 56.77	29 25.72	23 13 39.8	14 43.4	9.03220	9.3713	2.90	4.35
25 4 20.6	84	4 31 32.00	32 1.20	23 19 13.9	20 16.3	9.03307	9.3595	2.88	4.35
26 4 19.3	85	4 34 7.53	34 37.16	23 24 38.8	25 40.1	9.03392	9.3472	2.86	4.35
27 4 17.9	86	4 36 43.36	37 13.33	23 29 54.5	30 54.5	9.03474	9.3344	2.85	4.36
28 4 16.6	87	4 39 19.49	39 49.79	23 35 0.8	35 59.6	9.03554	9.3209	2.84	4.36
29 4 15.3	88	4 41 55.92	42 26.55	23 39 57.6	40 55.1	9.03631	9.3071	2.82	4.36
30 4 14.0	89	4 44 32.63	45 3.60	23 44 44.9	45 41.2	9.03706	9.2929	2.80	4.36
31 4 12.7	90	4 47 9.60	47 40.90	23 49 22.9	50 17.8	9.03778	9.2782	2.78	4.36
Apr. 1 4 11.3	91	4 49 46.81	50 18.45	23 53 51.4	54 44.9	9.03847	9.2630	2.77	4.36
2 4 10.0	92	4 52 24.27	52 56.26	23 58 10.4	59 2.4	9.03913	9.2469	2.76	4.36
3 4 8.7	93	4 55 1.97	55 34.31	24 2 19.6	3 10.1	9.03978	9.2300	2.74	4.37
4 4 7.4	94	4 57 39.90	58 12.58	24 6 19.0	7 8.0	9.04043	9.2122	2.72	4.37
5 4 6.1	95	5 0 18.07	0 51.09	24 10 8.8	10 56.2	9.04108	9.1936	2.72	4.37
6 4 4.8	96	5 2 56.46	3 29.82	24 13 48.7	14 34.4	9.04169	9.1734	2.71	4.38
7 4 3.5	97	5 5 35.08	6 8.77	24 17 18.7	18 2.7	9.04227	9.1534	2.70	4.38
8 4 2.3	98	5 8 13.90	8 47.92	24 20 38.9	21 21.1	9.04285	9.1332	2.69	4.38
9 4 0.9	99	5 10 52.92	11 27.28	24 23 49.1	24 29.4	9.04341	9.1093	2.68	4.38
10 3 59.6	100	5 13 32.14	14 6.83	24 26 49.3	27 27.7	9.04395	9.0850	2.67	4.38
11 3 58.3	101	5 16 11.56	16 46.58	24 29 39.4	30 16.0	9.04446	9.0592	2.66	4.39
12 3 57.0	102	5 18 51.18	19 26.52	24 32 19.4	32 54.1	9.04495	9.0317	2.65	4.39
13 3 55.8	103	5 21 30.97	22 6.64	24 34 49.2	35 21.9	9.04542	9.0021	2.63	4.39
14 3 54.6	104	5 24 10.92	24 46.93	24 37 8.8	37 39.5	9.04588	8.9704	2.61	4.39
15 3 53.3	105	5 26 51.04	27 27.38	24 39 18.2	39 46.9	9.04632	8.9360	2.59	4.39
16 3 52.0	106	5 29 31.33	30 7.99	24 41 17.4	41 43.9	9.04674	8.8988	2.57	4.39
17 3 50.7	107	5 32 11.77	32 48.76	24 43 6.4	43 30.7	9.04713	8.8579	2.54	4.39
18 3 49.5	108	5 34 52.34	35 29.67	24 44 45.0	45 7.2	9.04749	8.8123	2.51	4.40
19 3 48.3	109	5 37 33.04	38 10.69	24 46 13.3	46 33.2	9.04782	8.7616	2.47	4.40
20 3 47.0	110	5 40 13.86	40 51.84	24 47 31.3	47 48.8	9.04812	8.7039	2.42	4.40
21 3 45.7	111	5 42 54.79	43 33.10	24 48 38.9	48 54.0	9.04840	8.6365	2.37	4.40
22 3 44.4	112	5 45 35.82	46 14.46	24 49 36.0	49 48.8	9.04865	8.5569	2.31	4.40
23 3 43.2	113	5 48 16.94	48 55.90	24 50 22.7	50 33.1	9.04887	8.4596	2.25	4.40
24 3 42.0	114	5 50 58.12	51 37.40	24 50 59.1	51 7.0	9.04905	8.3358	2.17	4.40
25 3 40.7	115	5 53 39.37	54 18.97	24 51 25.1	51 30.5	9.04922	8.1589	+2.08	4.40
26 3 39.4	116	5 56 20.68	57 0.60	24 51 40.6	51 43.5	9.04936	+7.8528		4.40
27 3 38.1	117	5 59 2.04	59 42.28	24 51 45.6	51 46.0	9.04948	-6.1639		4.40
28 3 36.9	118	6 1 43.45	2 23.99	24 51 40.2	51 38.0	9.04957	7.8666		4.40
29 3 35.8	119	6 4 24.88	5 6.73	24 51 24.4	51 19.5	9.04964	8.1630		4.40
30 3 34.5	120	6 7 6.32	7 47.48	24 50 58.2	50 50.6	9.04968	8.3379		4.40
31 3 33.2	121	6 9 47.78	10 29.25	+24 50 21.7	50 11.3	+9.04970	-8.4618		-4.40

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.				Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of <i>t</i> in Sidereal Minutes.		Log Coefficient of <i>t</i> ² .		
					At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.	
May	d	h	m	d	h	m	s	m	s				
	1	3	33.2	121	6	9	47.78	10 29.25	+24 50' 21.7	50' 11.3	+9.04970	-8.4618	-4.40
	2	3	32.0	122	6	12	29.24	13 11.01	24 49 34.8	49 21.6	9.04970	8.5586	4.40
	3	3	30.8	123	6	15	10.70	15 52.77	24 48 37.5	48 21.4	9.04969	8.6385	4.40
	4	3	29.6	124	6	17	52.15	18 34.52	24 47 29.5	47 10.7	9.04965	8.7067	4.40
	5	3	28.3	125	6	20	33.58	21 16.26	24 46 10.9	45 49.3	9.04959	8.7647	4.40
	6	3	27.0	126	6	23	14.99	23 57.96	24 44 42.0	44 17.3	9.04951	8.8146	4.40
	7	3	25.8	127	6	25	56.36	26 39.62	24 43 2.8	42 34.8	9.04941	8.8619	4.40
	8	3	24.6	128	6	28	37.69	29 21.24	24 41 12.5	40 41.7	9.04927	8.9040	4.40
	9	3	23.4	129	6	31	18.98	32 2.81	24 39 11.9	38 38.0	9.04917	8.9413	-2.08
	10	3	22.1	130	6	34	0.21	34 44.34	24 37 0.9	36 23.9	9.04905	8.9756	4.39
	11	3	20.8	131	6	36	41.39	37 35.82	24 34 39.7	33 59.5	9.04891	9.0067	4.39
	12	3	19.6	132	6	39	22.54	40 7.26	24 32 8.3	31 24.9	9.04875	9.0362	4.39
	13	3	18.4	133	6	42	3.64	42 48.64	24 29 26.7	28 40.1	9.04857	9.0638	4.39
	14	3	17.2	134	6	44	44.67	45 29.95	24 26 34.8	25 44.9	9.04836	9.0900	4.39
	15	3	16.0	135	6	47	25.60	48 11.17	24 23 32.4	22 39.3	9.04814	9.1149	4.39
	16	3	14.8	136	6	50	6.43	50 52.28	24 20 19.7	19 23.4	9.04789	9.1382	4.39
	17	3	13.5	137	6	52	47.17	53 33.29	24 16 56.6	15 57.1	9.04763	9.1606	4.39
	18	3	12.2	138	6	55	27.81	56 14.20	24 13 23.1	12 20.2	9.04733	9.1815	4.39
	19	3	10.9	139	6	58	8.34	58 55.01	24 9 39.2	8 32.9	9.04702	9.2014	4.39
	20	3	9.7	140	7	0	48.75	1 35.67	24 5 45.1	4 35.4	9.04668	9.2204	4.39
	21	3	8.4	141	7	3	29.02	4 16.19	24 1 40.9	0 27.8	9.04632	9.2384	4.39
	22	3	7.1	142	7	6	9.15	6 56.58	23 57 26.7	56 10.1	9.04596	9.2554	4.39
	23	3	5.8	143	7	8	49.15	9 36.84	23 53 2.6	51 42.5	9.04556	9.2717	4.38
	24	3	4.5	144	7	11	29.02	12 16.95	23 48 28.5	47 4.9	9.04517	9.2873	4.38
25	3	3.3	145	7	14	8.73	14 56.91	23 43 44.6	42 17.5	9.04475	9.3023	4.38	
26	3	2.0	146	7	16	48.28	17 36.70	23 38 50.8	37 20.2	9.04430	9.3168	4.38	
27	3	0.7	147	7	19	27.66	20 16.32	23 33 47.3	32 13.1	9.04383	9.3307	4.37	
28	2	59.4	148	7	22	6.86	22 55.75	23 28 34.0	26 56.3	9.04334	9.3442	4.37	
29	2	58.1	146	7	24	45.89	25 35.02	23 23 11.0	21 29.8	9.04284	9.3571	4.36	
30	2	56.9	150	7	27	24.73	28 14.09	23 17 38.5	15 53.7	9.04232	9.3697	4.36	
June	31	2	55.6	151	7	30	3.37	30 52.96	23 11 56.4	10 7.9	9.04178	9.3819	4.36
	1	2	54.3	152	7	32	41.81	33 31.63	23 6 4.7	4 12.5	9.04123	9.3937	4.36
	2	2	53.0	153	7	35	20.05	36 10.10	22 60 3.4	58 7.5	9.04068	9.4052	4.35
	3	2	51.7	154	7	37	58.09	38 48.37	22 53 52.5	51 53.0	9.04011	9.4163	4.35
	4	2	50.4	155	7	40	35.92	41 26.43	22 47 32.2	45 29.0	9.03956	9.4271	4.35
	5	2	49.1	156	7	43	13.55	44 4.28	22 41 2.6	38 55.6	9.03897	9.4375	4.35
	6	2	47.8	157	7	45	50.97	46 41.22	22 34 23.6	32 12.9	9.03840	9.4476	4.34
	7	2	46.5	158	7	48	28.18	49 19.34	22 27 35.3	25 20.9	9.03783	9.4575	4.34
	8	2	45.2	159	7	51	5.18	51 56.56	22 20 37.7	18 19.5	9.03724	9.4670	4.34
	9	2	43.9	160	7	53	41.97	54 33.56	22 13 31.0	11 9.0	9.03664	9.4764	4.34
	10	2	42.6	161	7	56	18.54	57 10.34	22 6 15.2	3 49.5	9.03604	9.4855	4.34
	11	2	41.3	162	7	58	54.89	59 46.10	21 58 50.5	56 20.9	9.03543	9.4944	4.33
	12	2	39.9	163	8	1	31.02	2 23.24	21 51 16.6	48 43.2	9.03481	9.5030	4.33
	13	2	38.5	164	8	4	6.92	4 59.34	21 43 33.8	40 56.5	9.03418	9.5113	4.32
	14	2	37.2	165	8	6	42.58	7 35.21	21 35 42.0	33 0.9	9.03353	9.5194	4.32
	15	2	35.9	166	8	9	18.00	10 10.82	21 27 41.4	24 56.4	9.03286	9.5272	4.32
	16	2	34.6	167	8	11	53.19	12 46.21	21 19 32.0	16 43.2	9.03220	9.5349	4.31
	17	2	33.2	168	8	14	28.16	15 21.37	21 11 14.3	8 21.6	9.03152	9.5423	4.31
	18	2	31.8	169	8	17	2.88	17 56.29	20 62 48.1	59 51.5	9.03085	9.5495	4.30
	19	2	30.5	170	8	19	37.36	20 30.96	20 54 13.5	51 13.1	9.03018	9.5566	4.30
	20	2	29.2	171	8	22	11.61	23 5.40	20 45 30.6	42 26.3	9.02949	9.5636	4.30
	21	2	27.8	172	8	24	45.63	25 39.60	20 36 39.3	33 31.2	9.02879	9.5704	4.29
	22	2	26.4	173	8	27	19.39	28 13.55	20 27 39.6	24 27.7	9.02808	9.5770	4.29
	23	2	25.0	174	8	29	52.88	30 47.23	20 18 31.8	15 16.0	9.02734	9.5835	4.29
	24	2	23.6	175	8	32	26.10	33 20.62	20 9 16.0	5 56.3	9.02660	9.5898	4.29
25	2	22.2	176	8	34	59.05	35 53.75	19 59 52.1	56 28.6	9.02585	9.5960	4.28	
26	2	20.8	177	8	37	31.74	38 26.62	19 50 20.1	46 52.8	9.02510	9.6020	4.27	
27	2	19.4	178	8	40	4.17	40 59.23	19 40 40.3	37 9.1	9.02435	9.6078	4.27	
28	2	18.0	179	8	42	36.34	43 31.57	19 30 52.8	27 17.8	9.02360	9.6135	4.26	
29	2	16.6	180	8	45	8.25	46 3.65	19 20 57.6	17 18.8	9.02285	9.6191	4.26	
30	2	15.2	181	8	47	39.90	48 35.47	19 10 54.9	7 12.3	9.02211	9.6245	4.26	
31	2	13.8	182	8	50	11.29	50 7.03	+18 60 44.6	56 58.2	+9.02136	-9.6299	-4.25	

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
July	d h m	d h m s	m s	+18 60 44.6	56 58.2	+9.02136	-9.6299	-2.81	-4.25
1	2 13.8	182 8 50 11.22	50 7.03	18 50 26.8	46 36.7	9.02062	9.6351	2.81	4.25
2	2 12.4	183 8 52 42.43	53 38.33	18 40 1.6	36 7.7	9.01987	9.6403	2.81	4.24
3	2 10.9	184 8 55 13.31	56 9.36	18 29 20.0	25 31.2	9.01913	9.6454	2.79	4.24
4	2 9.5	185 8 57 43.94	58 40.15	18 18 49.0	24 47.4	9.01839	9.6503	2.77	4.23
5	2 8.0	186 9 0 14.30	1 10.67	18 8 1.7	3 56.3	9.01767	9.6552	2.75	4.22
6	2 6.6	187 9 2 44.40	3 40.93	17 57 7.3	52 57.0	9.01696	9.6599	2.72	4.21
7	2 5.2	188 9 5 14.24	6 10.93	17 46 5.8	41 52.0	9.01625	9.6644	2.72	4.21
8	2 3.8	189 9 7 43.84	8 40.72	17 34 57.6	30 40.1	9.01558	9.6688	2.72	4.21
9	2 2.4	190 9 10 13.22	11 10.27	17 23 42.5	19 21.3	9.01491	9.6732	2.73	4.20
10	2 0.9	191 9 12 42.37	13 39.60	17 12 20.6	7 55.7	9.01424	9.6776	2.73	4.20
11	1 59.4	192 9 15 11.28	16 8.69	16 60 51.9	56 23.3	9.01357	9.6818	2.74	4.19
12	1 57.9	193 9 17 39.96	18 37.54	16 49 16.5	44 44.2	9.01290	9.6860	2.74	4.19
13	1 56.5	194 9 20 8.42	21 6.16	16 37 34.4	32 58.4	9.01223	9.6900	2.74	4.18
14	1 55.0	195 9 22 36.65	23 34.56	16 25 45.9	21 6.2	9.01156	9.6940	2.75	4.18
15	1 53.5	196 9 25 4.66	26 2.73	16 13 51.0	9 7.6	9.01089	9.6978	2.75	4.17
16	1 52.0	197 9 27 32.44	28 30.66	15 61 49.9	57 2.8	9.01021	9.7015	2.76	4.16
17	1 50.5	198 9 29 59.99	30 58.37	15 49 42.7	44 51.9	9.00953	9.7052	2.76	4.16
18	1 49.1	199 9 32 27.30	33 25.84	15 37 29.4	32 34.8	9.00884	9.7088	2.75	4.16
19	1 47.6	200 9 34 54.37	35 53.07	15 25 9.9	20 11.6	9.00815	9.7124	2.74	4.15
20	1 46.1	201 9 37 21.21	38 20.06	15 12 44.3	7 42.4	9.00746	9.7159	2.73	4.15
21	1 44.6	202 9 39 47.82	40 46.82	14 60 12.9	55 7.3	9.00679	9.7192	2.72	4.14
22	1 43.1	203 9 42 14.19	43 13.35	14 47 35.8	42 26.6	9.00612	9.7224	2.72	4.14
23	1 41.6	204 9 44 40.33	45 39.65	14 34 53.1	29 40.3	9.00548	9.7256	2.71	4.13
24	1 40.1	205 9 47 6.24	48 5.73	14 22 4.9	16 48.4	9.00484	9.7287	2.70	4.13
25	1 38.6	206 9 49 31.95	50 31.63	14 9 11.1	3 51.1	9.00423	9.7318	2.69	4.12
26	1 37.1	207 9 51 57.46	52 57.27	13 56 11.8	50 48.3	9.00363	9.7349	2.68	4.11
27	1 35.6	208 9 54 22.77	55 22.74	13 43 7.1	37 40.1	9.00305	9.7378	2.67	4.11
28	1 34.1	209 9 56 47.88	57 48.02	13 29 57.2	24 26.7	9.00249	9.7406	2.66	4.10
29	1 32.6	210 9 59 12.80	60 13.11	13 26 42.1	21 8.1	9.00193	9.7434	2.65	4.10
30	1 31.1	211 10 1 37.53	2 38.01	12 63 22.1	57 44.6	9.00137	9.7462	2.64	4.09
Aug.	1 29.6	212 10 4 2.08	5 2.72	12 49 57.0	44 16.1	9.00081	9.7489	2.63	4.08
1	1 28.0	213 10 6 26.45	7 27.25	12 36 27.0	30 42.6	9.00025	9.7515	2.61	4.08
2	1 26.5	214 10 8 50.63	9 51.69	12 22 52.0	17 4.3	8.99970	9.7541	2.59	4.07
3	1 25.0	215 10 11 14.62	12 15.76	12 9 12.2	3 21.1	8.99916	9.7567	2.57	4.06
4	1 23.5	216 10 13 38.43	14 39.74	11 55 27.6	49 33.1	8.99866	9.7592	2.55	4.05
5	1 21.9	217 10 16 2.06	17 3.54	11 41 38.3	35 40.5	8.99822	9.7616	2.53	4.04
6	1 20.3	218 10 18 25.54	19 27.19	11 27 44.4	21 43.3	8.99780	9.7640	2.53	4.04
7	1 18.8	219 10 20 48.88	21 50.70	11 13 46.0	7 41.5	8.99739	9.7663	2.52	4.03
8	1 17.3	220 10 23 12.08	24 14.08	10 59 43.2	53 35.3	8.99698	9.7685	2.51	4.04
9	1 15.7	221 10 25 35.15	26 37.33	10 45 36.1	39 25.0	8.99657	9.7707	2.50	4.01
10	1 14.1	222 10 27 58.08	29 0.44	10 31 24.8	25 10.5	8.99617	9.7729	2.49	4.00
11	1 12.5	223 10 30 20.88	31 23.42	10 17 9.3	10 51.8	8.99577	9.7750	2.47	3.99
12	1 11.0	224 10 32 43.55	33 46.26	9 62 49.6	56 20.0	8.99537	9.7770	2.45	3.98
13	1 9.5	225 10 35 6.08	36 8.97	9 48 26.1	42 2.3	8.99498	9.7789	2.43	3.97
14	1 7.9	226 10 37 28.48	38 31.56	9 33 58.8	27 31.8	8.99462	9.7808	2.41	3.96
15	1 6.3	227 10 39 50.76	40 54.02	9 19 27.7	12 57.6	8.99427	9.7827	2.36	3.95
16	1 4.7	228 10 42 12.93	43 16.37	9 6 52.9	58 19.6	8.99395	9.7845	2.36	3.94
17	1 3.2	229 10 44 34.98	45 38.61	8 50 14.4	43 38.1	8.99365	9.7863	2.34	3.93
18	1 1.7	230 10 46 56.93	48 0.75	8 35 32.4	28 53.2	8.99336	9.7880	2.32	3.92
19	1 0.1	231 10 49 18.79	50 22.80	8 20 47.1	14 4.9	8.99308	9.7896	2.30	3.91
20	0 58.5	232 10 51 40.56	52 44.76	7 65 58.5	59 13.3	8.99280	9.7912	2.28	3.90
21	0 56.9	233 10 54 2.24	55 6.62	7 51 6.6	44 18.5	8.99253	9.7928	2.25	3.89
22	0 55.4	234 10 56 23.82	57 28.39	7 36 11.4	29 20.5	8.99228	9.7943	2.22	3.88
23	0 53.8	235 10 58 45.31	59 50.08	7 21 13.3	14 19.5	8.99206	9.7957	2.19	3.88
24	0 52.2	236 11 1 6.73	2 11.70	6 66 12.2	59 15.5	8.99186	9.7971	2.16	3.84
25	0 50.6	237 11 3 28.08	4 33.26	6 51 8.2	44 8.8	8.99170	9.7985	2.13	3.82
26	0 49.0	238 11 5 49.38	6 54.77	6 36 1.4	28 59.2	8.99155	9.7998	-2.08	3.81
27	0 47.5	239 11 8 10.64	9 16.23	6 20 52.0	13 47.1	8.99140	9.8011		3.80
28	0 45.9	240 11 10 31.85	11 37.65	5 65 39.9	58 32.3	8.99127	9.8024		3.78
29	0 44.3	241 11 12 53.01	13 59.02	5 50 25.2	43 14.8	8.99113	9.8036		3.76
30	0 42.7	242 11 15 14.12	16 20.35	5 35 7.9	27 54.8	+8.99104	-9.8048		-3.74
31	0 41.1	243 11 17 35.18	18 41.64						

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Sept. 1 0 39.6	244	11 19 56.21	21 2.88	+ 5 19 48.2	12 32.6	+8.99007	-0.8059		-3.72
2 0 38.0	245	11 22 17.22	23 24.11	4 64 26.2	57 8.1	8.99094	9.8070		3.70
3 0 36.4	246	11 24 38.23	25 45.34	4 49 1.9	41 41.2	8.99095	9.8080		3.68
4 0 34.8	247	11 26 59.25	28 6.59	4 33 35.3	26 12.2	8.99097	9.8090		3.66
5 0 33.2	248	11 29 20.29	30 27.87	4 18 6.7	10 41.1	8.99102	9.8100		3.64
6 0 31.7	249	11 31 41.35	32 49.17	3 62 36.1	55 8.1	8.99106	9.8109		3.62
7 0 30.1	250	11 34 2.42	35 10.48	3 47 3.7	39 33.2	8.99111	9.8117		3.60
8 0 28.5	251	11 36 23.51	37 31.81	3 31 29.4	23 56.5	8.99118	9.8126		3.58
9 0 26.9	252	11 38 44.63	39 53.18	3 15 53.3	8 18.0	8.99129	9.8134		3.56
10 0 25.3	253	11 41 5.79	42 14.59	2 60 15.5	52 37.9	8.99141	9.8141	+2.08	3.53
11 0 23.8	254	11 43 26.99	44 36.05	2 44 36.2	36 56.4	8.99158	9.8148	2.08	3.50
12 0 22.2	255	11 45 48.25	46 57.56	2 28 55.6	21 13.5	8.99175	9.8154	2.09	3.47
13 0 20.6	256	11 48 9.57	49 19.14	2 13 13.5	5 29.2	8.99193	9.8160	2.11	3.44
14 0 19.0	257	11 50 30.95	51 40.78	1 57 30.2	49 43.8	8.99210	9.8166	2.13	3.41
15 0 17.4	258	11 52 52.38	54 2.48	1 41 45.8	33 57.3	8.99227	9.8171	2.16	3.38
16 0 15.9	259	11 55 13.87	56 24.24	1 26 0.3	18 9.8	8.99247	9.8176	2.21	3.34
17 0 14.3	260	11 57 35.42	58 46.06	1 10 13.8	2 21.3	8.99266	9.8180	2.26	3.28
18 0 12.7	261	11 59 57.03	61 7.94	0 54 26.5	46 32.1	8.99289	9.8184	2.31	3.21
19 0 11.1	262	12 2 18.72	3 29.91	0 38 38.4	30 42.1	8.99315	9.8187	2.36	3.15
20 0 9.5	263	12 4 40.51	5 51.98	0 22 49.7	14 51.5	8.99345	9.8190	2.42	-3.08
21 0 8.0	264	12 7 2.41	8 14.17	+ 0 7 0.4	0 59.6	8.99378	9.8192	2.46	
22 0 6.4	265	12 9 24.42	10 36.47	- 0 8 49.4	16 51.2	8.99413	9.8194	2.49	
23 0 4.8	266	12 11 46.54	12 58.89	0 24 39.6	32 43.1	8.99449	9.8195	2.52	
24 0 3.2	267	12 14 8.78	15 21.43	0 30 30.0	38 35.2	8.99486	9.8196	2.54	
25 0 1.6	268	12 16 31.15	17 44.10	0 56 20.6	64 27.4	8.99524	9.8197	2.56	
26 0 0.1	269	12 18 53.66	20 6.91	1 12 11.4	20 19.8	8.99564	9.8197	2.58	
26 23 58.6	270	12 21 16.32	22 29.88	1 28 2.1	36 12.0	8.99608	9.8197	2.60	
27 23 57.0	271	12 23 39.13	24 53.01	1 43 52.7	52 4.1	8.99653	9.8197	2.62	
28 23 55.4	272	12 26 2.00	27 16.29	1 59 43.2	67 56.0	8.99704	9.8196	2.63	
29 23 53.9	273	12 28 25.20	29 39.72	2 15 33.6	23 47.8	8.99755	9.8195	2.64	
30 23 52.3	274	12 30 48.47	32 3.31	2 31 23.8	39 39.4	8.99811	9.8194	2.65	+3.04
Oct. 1 23 50.7	275	12 33 11.92	34 27.09	2 47 13.5	55 30.4	8.99868	9.8194	2.66	3.10
2 23 49.1	276	12 35 35.56	36 51.08	3 3 2.6	11 20.8	8.99927	9.8188	2.67	3.16
3 23 47.6	277	12 37 59.41	39 15.29	3 18 51.0	27 10.5	8.99988	9.8185	2.68	3.22
4 23 46.2	278	12 40 23.48	41 39.71	3 34 38.7	42 59.3	9.00051	9.8182	2.70	3.28
5 23 44.7	279	12 42 47.76	44 4.35	3 50 25.6	58 47.4	9.00116	9.8176	2.72	3.34
6 23 43.1	280	12 45 12.25	46 29.21	4 6 11.7	14 34.6	9.00181	9.8174	2.74	3.40
7 23 41.6	281	12 47 36.96	48 54.28	4 21 56.8	30 20.7	9.00247	9.8169	2.74	3.44
8 23 40.1	282	12 50 1.90	51 19.58	4 37 40.7	46 5.4	9.00314	9.8163	2.75	3.48
9 23 38.6	283	12 52 27.07	53 45.13	4 53 23.3	61 48.8	9.00389	9.8157	2.76	3.52
10 23 37.1	284	12 54 52.49	56 10.93	5 9 4.6	17 30.9	9.00465	9.8151	2.77	3.55
11 23 35.6	285	12 57 18.17	58 36.99	5 24 44.4	33 11.4	9.00540	9.8144	2.78	3.58
12 23 34.1	286	12 59 44.09	61 3.30	5 40 22.5	48 50.2	9.00617	9.8136	2.79	3.62
13 23 32.6	287	13 2 10.27	3 29.87	5 55 59.0	64 27.3	9.00694	9.8128	2.80	3.65
14 23 31.1	288	13 4 36.71	5 56.70	6 11 33.7	20 2.5	9.00769	9.8119	2.80	3.68
15 23 29.6	289	13 7 3.41	8 23.80	6 27 6.5	35 35.8	9.00848	9.8110	2.82	3.71
16 23 28.1	290	13 9 30.39	10 51.18	6 42 37.2	51 6.9	9.00931	9.8100	2.83	3.74
17 23 26.6	291	13 11 57.65	13 18.84	6 58 5.8	66 35.8	9.01012	9.8089	2.83	3.76
18 23 25.1	292	13 14 25.18	15 46.79	7 13 32.0	22 2.3	9.01095	9.8078	2.84	3.78
19 23 23.6	293	13 16 53.00	18 15.03	7 28 55.9	37 26.4	9.01181	9.8067	2.85	3.80
20 23 22.2	294	13 19 21.12	20 43.58	7 44 17.3	52 48.0	9.01271	9.8055	2.86	3.82
21 23 20.8	295	13 21 49.55	23 12.44	7 59 36.1	68 6.9	9.01362	9.8042	2.87	3.84
22 23 19.3	296	13 24 18.29	25 41.61	8 14 52.2	23 23.0	9.01452	9.8029	2.88	3.86
23 23 17.8	297	13 26 47.34	28 11.10	8 30 5.5	38 36.3	9.01545	9.8015	2.89	3.88
24 23 16.4	298	13 29 16.72	30 40.93	8 45 15.7	53 46.4	9.01643	9.8001	2.90	3.89
25 23 15.0	299	13 31 46.44	33 11.10	9 0 23.0	8 53.5	9.01741	9.7987	2.91	3.90
26 23 13.6	300	13 34 16.50	35 41.62	9 15 27.2	23 57.5	9.01840	9.7972	2.92	3.91
27 23 12.1	301	13 36 46.90	38 12.48	9 30 28.3	38 58.2	9.01941	9.7956	2.93	3.93
28 23 10.7	302	13 39 17.66	40 43.71	9 45 25.9	53 55.4	9.02044	9.7939	2.94	3.94
29 23 9.3	303	13 41 48.78	43 15.32	10 0 20.0	8 49.1	9.02149	9.7922	2.95	3.95
30 23 7.9	304	13 44 20.27	45 47.30	10 15 10.5	23 39.0	9.02257	9.7904	2.96	3.96
31 23 6.5	305	13 46 52.14	48 19.66	-10 29 57.3	38 25.2	+9.02367	-9.7886	+2.97	+3.97

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Data.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of <i>t</i> in Sidereal Minutes.		Log Coefficient of <i>t</i> ² .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Nov. 1 23 5.1	306	13 49 24.40	50 52.41	-10 44' 40.3"	53' 7.5"	+9.02478	-9.7867	+2.97	+3.99
2 23 3.7	307	13 51 57.05	53 25.56	10 59 19.4	67 45.8	9.02591	9.7847	2.97	4.01
3 23 2.3	308	13 54 30.10	55 59.11	11 13 54.4	22 19.9	9.02704	9.7827	2.98	4.02
4 23 0.9	309	13 57 3.55	58 33.07	11 28 25.2	36 49.6	9.02817	9.7805	2.99	4.03
5 22 59.6	310	13 59 37.40	61 7.44	11 42 51.6	51 15.0	9.03037	9.7783	3.00	4.04
6 22 58.2	311	14 2 11.67	3 42.22	11 57 13.6	65 35.9	9.03051	9.7760	3.00	4.06
7 22 56.8	312	14 4 46.36	6 17.44	12 11 31.0	19 52.1	9.03171	9.7737	3.00	4.07
8 22 55.5	313	14 7 21.48	8 53.08	12 25 43.8	34 3.6	9.03290	9.7712	3.00	4.09
9 22 54.2	314	14 9 57.02	11 29.16	12 39 51.7	48 10.0	9.03407	9.7687	3.00	4.09
10 22 52.9	315	14 12 32.98	14 5.66	12 53 54.5	62 11.3	9.03527	9.7661	3.01	4.10
11 22 51.6	316	14 15 9.38	16 42.60	13 7 52.2	16 7.4	9.03647	9.7634	3.01	4.11
12 22 50.3	317	14 17 46.21	19 19.98	13 21 44.7	29 58.1	9.03768	9.7606	3.01	4.12
13 22 49.0	318	14 20 23.48	21 57.80	13 35 31.8	43 43.4	9.03889	9.7578	3.02	4.13
14 22 47.7	319	14 23 1.19	24 36.06	13 49 13.4	57 23.1	9.04010	9.7548	3.02	4.14
15 22 46.4	320	14 25 39.34	27 14.77	14 2 49.3	10 57.0	9.04134	9.7518	3.03	4.15
16 22 45.1	321	14 28 17.95	29 53.94	14 16 19.4	24 25.0	9.04259	9.7486	3.03	4.16
17 22 43.8	322	14 30 57.01	32 33.56	14 29 43.6	37 47.0	9.04381	9.7454	3.04	4.17
18 22 42.5	323	14 33 36.52	35 13.65	14 43 1.7	51 2.8	9.04505	9.7420	3.04	4.18
19 22 41.2	324	14 36 16.49	37 54.21	14 56 13.6	64 12.3	9.04626	9.7386	3.05	4.19
20 22 40.0	325	14 38 56.92	40 35.23	15 9 19.1	17 15.4	9.04754	9.7351	3.06	4.19
21 22 38.7	326	14 41 37.82	43 16.72	15 22 18.2	30 12.0	9.04884	9.7315	3.06	4.20
22 22 37.4	327	14 44 19.20	45 58.69	15 35 10.8	43 2.0	9.05015	9.7278	3.07	4.21
23 22 36.2	328	14 47 1.07	48 41.16	15 47 56.8	55 45.2	9.05145	9.7240	3.07	4.22
24 22 35.0	329	14 49 43.42	51 24.12	16 0 36.1	8 21.5	9.05273	9.7200	3.08	4.23
25 22 33.8	330	14 52 26.25	54 7.51	16 13 8.3	20 50.7	9.05404	9.7159	3.09	4.24
26 22 32.6	331	14 55 9.58	56 51.53	16 25 33.2	33 12.5	9.05538	9.7117	3.09	4.24
27 22 31.4	332	14 57 53.42	59 35.99	16 37 50.8	45 26.8	9.05672	9.7074	3.09	4.25
28 22 30.2	333	15 0 37.76	2 20.96	16 50 1.1	57 33.8	9.05804	9.7030	3.09	4.26
29 22 29.0	334	15 3 22.60	5 6.44	17 2 3.9	9 33.2	9.05937	9.6984	3.10	4.27
30 22 27.8	335	15 6 7.95	7 52.43	17 13 59.1	21 24.8	9.06070	9.6937	3.10	4.27
Dec. 1 22 26.6	336	15 8 53.80	10 38.93	17 25 46.5	33 8.6	9.06204	9.6889	3.10	4.28
2 22 25.4	337	15 11 40.17	13 25.95	17 37 26.1	44 44.4	9.06339	9.6839	3.10	4.29
3 22 24.3	338	15 14 27.06	16 13.50	17 48 57.5	56 12.0	9.06473	9.6788	3.10	4.30
4 22 23.2	339	15 17 14.46	19 1.56	18 0 20.7	7 31.2	9.06607	9.6736	3.10	4.31
5 22 22.2	340	15 20 2.38	21 50.14	18 11 35.5	18 41.9	9.06741	9.6681	3.10	4.31
6 22 21.1	341	15 22 50.82	24 30.24	18 22 41.8	29 44.0	9.06876	9.6625	3.10	4.32
7 22 20.0	342	15 25 39.78	27 28.87	18 33 39.5	40 37.3	9.07009	9.6568	3.09	4.33
8 22 18.9	343	15 28 29.26	30 19.01	18 44 28.5	51 21.8	9.07140	9.6509	3.09	4.34
9 22 17.8	344	15 31 19.23	33 9.66	18 55 8.5	61 57.2	9.07269	9.6448	3.09	4.35
10 22 16.7	345	15 34 9.73	36 0.82	19 5 39.6	12 23.5	9.07399	9.6385	3.09	4.35
11 22 15.6	346	15 37 0.73	38 52.49	19 16 1.3	22 40.4	9.07527	9.6320	3.09	4.36
12 22 14.5	347	15 39 52.23	41 44.67	19 26 13.7	32 47.8	9.07655	9.6253	3.09	4.37
13 22 13.4	348	15 42 44.24	44 37.36	19 36 16.6	42 45.5	9.07782	9.6185	3.09	4.38
14 22 12.3	349	15 45 36.75	47 30.55	19 46 9.9	52 33.5	9.07908	9.6114	3.09	4.38
15 22 11.3	350	15 48 29.76	50 24.25	19 55 53.4	62 11.6	9.08034	9.6041	3.09	4.38
16 22 10.2	351	15 51 23.27	53 18.44	20 5 27.1	11 39.8	9.08158	9.5965	3.08	4.39
17 22 9.2	352	15 54 17.56	56 13.12	20 14 50.7	20 57.8	9.08281	9.5887	3.08	4.40
18 22 8.2	353	15 57 11.77	59 8.30	20 24 4.1	30 5.4	9.08406	9.5807	3.07	4.41
19 22 7.2	354	16 0 6.77	2 3.99	20 33 7.2	39 2.6	9.08530	9.5724	3.07	4.41
20 22 6.2	355	16 3 2.27	5 0.17	20 41 59.9	47 49.3	9.08652	9.5638	3.07	4.42
21 22 5.2	356	16 5 58.26	7 56.83	20 50 42.1	56 25.3	9.08772	9.5550	3.07	4.42
22 22 4.2	357	16 8 54.73	10 53.99	20 59 13.6	64 50.6	9.08891	9.5459	3.07	4.43
23 22 3.2	358	16 11 51.69	13 51.64	21 7 34.3	13 4.9	9.09012	9.5364	3.06	4.43
24 22 2.2	359	16 14 49.14	16 49.77	21 15 43.9	21 8.0	9.09133	9.5266	3.06	4.43
25 22 1.3	360	16 17 47.07	19 48.38	21 23 42.3	28 59.8	9.09246	9.5164	3.06	4.43
26 22 0.3	361	16 20 45.47	22 47.48	21 31 29.7	36 40.3	9.09362	9.5059	3.05	4.44
27 21 59.3	362	16 23 44.35	25 47.06	21 39 6.0	44 9.5	9.09477	9.4950	3.05	4.45
28 21 58.4	363	16 26 43.70	28 47.11	21 46 30.8	51 27.3	9.09590	9.4839	3.04	4.46
29 21 57.5	364	16 29 43.51	31 47.63	21 53 43.9	58 33.4	9.09700	9.4723	3.04	4.46
30 21 56.6	365	16 32 43.77	34 48.60	22 0 45.2	5 27.4	9.09809	9.4602	3.04	4.46
31 21 55.7	366	16 35 44.49	37 50.04	22 7 34.7	12 9.5	9.09920	9.4476	3.03	4.46
32 21 54.8	367	16 38 45.67	40 51.94	-22 14 12.4	18 39.6	+9.10030	-9.4345	+3.02	+4.46

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Jan. 0 18 51.5	0	13 33 47.13	34 2.17	- 8 26 7.7	27 28.0	+8.2694	-8.9969	-3.08	+3.90
1 18 48.0	1	13 34 13.66	34 28.40	8 28 29.0	29 47.4	8.2612	8.9867	3.08	3.90
2 18 44.5	2	13 34 39.67	34 54.13	8 30 46.6	32 3.4	8.2522	8.9754	3.09	3.90
3 18 41.0	3	13 35 5.14	35 19.29	8 33 1.2	34 16.1	8.2430	8.9651	3.09	3.91
4 18 37.5	4	13 35 30.06	35 43.92	8 35 12.5	36 25.5	8.2332	8.9543	3.10	3.91
5 18 34.0	5	13 35 54.44	36 8.00	8 37 20.5	38 31.5	8.2238	8.9427	3.11	3.92
6 18 30.4	6	13 36 18.28	36 31.53	8 39 25.0	40 34.1	8.2138	8.9304	3.12	3.92
7 18 26.8	7	13 36 41.56	36 54.50	8 41 26.0	42 33.2	8.2033	8.9182	3.12	3.93
8 18 23.2	8	13 37 4.28	37 16.90	8 43 23.6	44 28.8	8.1924	8.9053	3.13	3.93
9 18 19.7	9	13 37 26.43	37 38.73	8 45 17.6	46 20.9	8.1813	8.8919	3.13	3.93
10 18 16.1	10	13 37 48.00	37 59.98	8 47 8.1	48 9.4	8.1695	8.8779	3.14	3.94
11 18 12.5	11	13 38 8.99	38 20.65	8 48 55.0	49 54.2	8.1574	8.8632	3.15	3.94
12 18 8.9	12	13 38 29.39	38 40.72	8 50 38.3	51 35.5	8.1448	8.8476	3.15	3.94
13 18 5.3	13	13 38 49.20	39 0.19	8 52 17.9	53 13.1	8.1318	8.8319	3.16	3.94
14 18 1.6	14	13 39 8.41	39 19.05	8 53 53.9	54 47.0	8.1181	8.8152	3.16	3.95
15 17 58.0	15	13 39 27.00	39 37.30	8 55 26.2	56 17.2	8.1036	8.7978	3.17	3.95
16 17 54.4	16	13 39 44.97	39 54.92	8 56 54.8	57 43.7	8.0883	8.7796	3.17	3.95
17 17 50.7	17	13 40 2.31	40 11.91	8 58 19.7	59 6.4	8.0725	8.7602	3.17	3.95
18 17 47.1	18	13 40 19.02	40 28.26	8 59 40.8	0 25.3	8.0562	8.7392	3.18	3.95
19 17 43.4	19	13 40 35.09	40 43.97	9 0 58.0	1 40.3	8.0399	8.7184	3.18	3.95
20 17 39.7	20	13 40 50.52	40 59.03	9 2 11.4	2 51.5	8.0206	8.6969	3.19	3.96
21 17 36.0	21	13 41 5.30	41 13.44	9 3 21.0	3 58.9	8.0015	8.6722	3.19	3.96
22 17 32.3	22	13 41 19.42	41 27.19	9 4 26.8	5 2.5	7.9812	8.6471	3.19	3.96
23 17 28.6	23	13 41 32.88	41 40.27	9 5 28.8	6 2.3	7.9599	8.6198	3.20	3.96
24 17 24.9	24	13 41 45.68	41 52.68	9 6 26.8	6 58.1	7.9371	8.5906	3.20	3.97
25 17 21.2	25	13 41 57.81	42 4.43	9 7 20.9	7 50.0	7.9132	8.5593	3.21	3.97
26 17 17.4	26	13 42 9.27	42 15.51	9 8 11.2	8 38.0	7.8877	8.5265	3.21	3.97
27 17 13.7	27	13 42 20.05	42 25.91	9 8 57.6	9 22.2	7.8603	8.4890	3.22	3.97
28 17 9.9	28	13 42 30.16	42 35.63	9 9 40.1	10 2.5	7.8310	8.4491	3.22	3.97
29 17 6.1	29	13 42 39.59	42 44.67	9 10 18.7	10 38.8	7.7994	8.4051	3.22	3.98
30 17 2.3	30	13 42 48.33	42 53.02	9 10 53.3	11 11.1	7.7654	8.3548	3.22	3.98
31 16 58.5	31	13 42 56.38	43 0.68	9 11 23.9	11 39.5	7.7284	8.2980	3.23	3.98
Feb. 1 16 54.7	32	13 43 3.75	43 7.65	9 11 50.6	12 3.9	7.6876	8.2325	3.23	3.98
2 16 50.9	33	13 43 10.42	43 13.92	9 12 13.2	12 24.3	7.6423	8.1555	3.23	3.99
3 16 47.1	34	13 43 16.39	43 19.49	9 12 31.8	12 40.7	7.5913	8.0630	3.23	3.99
4 16 43.3	35	13 43 21.66	43 24.36	9 12 46.5	12 53.1	7.5336	7.9454	3.23	3.99
5 16 39.4	36	13 43 26.23	43 28.53	9 12 57.3	13 1.6	7.4669	7.7811	3.23	3.99
6 16 35.5	37	13 43 30.10	43 31.99	9 13 4.0	13 6.0	7.3869	7.5137	3.23	3.99
7 16 31.6	38	13 43 33.25	43 34.74	9 13 6.7	13 6.4	7.2888	-6.6867	3.23	3.99
8 16 27.7	39	13 43 35.69	43 36.78	9 13 5.4	13 2.9	7.1608	+7.3601	3.23	3.99
9 16 23.8	40	13 43 37.42	43 38.10	9 13 0.1	12 55.3	6.9783	7.7078	3.23	3.99
10 16 19.9	41	13 43 38.43	43 38.70	9 12 50.7	12 43.7	+6.6578	7.8985	3.23	3.99
11 16 16.0	42	13 43 38.73	43 38.59	9 12 37.3	12 28.0	-5.6198	8.0305	3.23	3.99
12 16 12.0	43	13 43 38.32	43 37.76	9 12 19.9	12 8.3	6.7309	8.1316	3.23	3.98
13 16 8.1	44	13 43 37.19	43 36.21	9 11 58.5	11 44.6	7.0163	8.2127	3.23	3.98
14 16 4.1	45	13 43 35.33	43 33.94	9 11 33.0	11 16.8	7.1866	8.2809	3.23	3.98
15 16 0.1	46	13 43 32.75	43 30.96	9 11 3.5	10 45.0	7.3092	8.3399	3.23	3.98
16 15 56.1	47	13 43 29.46	43 27.26	9 10 30.0	10 9.2	7.4039	8.3918	3.23	3.98
17 15 52.1	48	13 43 25.45	43 22.84	9 9 52.5	9 29.4	7.4816	8.4376	3.23	3.98
18 15 48.1	49	13 43 20.73	43 17.71	9 9 11.0	8 45.7	7.5475	8.4791	3.23	3.97
19 15 44.1	50	13 43 15.30	43 11.87	9 8 25.6	7 58.1	7.6047	8.5165	3.23	3.97
20 15 40.0	51	13 43 9.15	43 5.32	9 7 36.3	7 6.6	7.6545	8.5509	3.23	3.97
21 15 36.0	52	13 43 2.30	42 58.07	9 6 43.1	6 11.2	7.6989	8.5824	3.22	3.97
22 15 31.9	53	13 42 54.75	42 50.11	9 5 46.0	5 11.9	7.7392	8.6117	3.22	3.96
23 15 27.8	54	13 42 46.50	42 41.46	9 4 45.2	4 8.8	7.7759	8.6389	3.22	3.96
24 15 23.8	55	13 42 37.56	42 32.14	9 3 40.6	3 2.0	7.8091	8.6644	3.21	3.95
25 15 19.7	56	13 42 27.94	42 22.13	9 2 32.2	1 51.4	7.8399	8.6885	3.21	3.95
26 15 15.5	57	13 42 17.64	42 11.45	9 1 20.0	0 37.1	7.8681	8.7108	3.21	3.95
27 15 11.3	58	13 42 6.67	42 0.10	9 0 4.1	59 19.1	7.8947	8.7320	3.20	3.94
28 15 7.2	59	13 41 55.03	41 48.08	8 58 44.5	57 57.5	7.9197	8.7522	3.20	3.94
29 15 3.1	60	13 41 42.73	41 35.41	8 57 21.2	56 32.2	7.9430	8.7710	3.19	3.93
30 14 58.9	61	13 41 29.77	41 22.10	- 8 55 54.4	55 3.4	-7.9648	+8.7885	-3.19	+3.93

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. 1 15 3.1	60	13 41 42.73	41 35.41	- 8 57 21.2	56 32.2	-7.9430	+8.7710	-3.19	+3.93
2 14 58.9	61	13 41 29.77	41 22.10	8 55 54.4	55 3.4	7.9648	8.7885	3.19	3.93
3 14 54.8	62	13 41 16.16	41 8.14	8 54 24.1	53 31.1	7.9852	8.8054	3.18	3.92
4 14 50.6	63	13 41 1.92	40 53.55	8 52 50.3	51 55.4	8.0045	8.8216	3.18	3.92
5 14 46.4	64	13 40 47.05	40 38.34	8 51 13.0	50 16.2	8.0228	8.8368	3.18	3.91
6 14 42.2	65	13 40 31.56	40 22.50	8 49 32.3	48 33.6	8.0403	8.8514	3.17	3.90
7 14 38.0	66	13 40 15.45	40 6.04	8 47 48.3	46 47.8	8.0567	8.8653	3.17	3.89
8 14 33.8	67	13 39 58.74	39 48.98	8 46 1.0	44 58.7	8.0722	8.8787	3.16	3.88
9 14 29.6	68	13 39 41.43	39 31.33	8 44 10.5	43 6.4	8.0871	8.8912	3.16	3.87
10 14 25.3	69	13 39 23.53	39 13.10	8 42 16.7	41 10.8	8.1014	8.9033	3.15	3.86
11 14 21.1	70	13 39 5.05	39 54.31	8 40 19.8	39 12.1	8.1148	8.9150	3.14	3.85
12 14 16.9	71	13 38 46.01	38 34.95	8 38 19.8	37 10.3	8.1276	8.9261	3.13	3.84
13 14 12.6	72	13 38 26.41	38 15.04	8 36 16.7	35 5.5	8.1399	8.9367	3.12	3.83
14 14 8.3	73	13 38 6.26	38 54.59	8 34 10.7	32 57.9	8.1514	8.9468	3.11	3.82
15 14 4.1	74	13 37 45.59	37 33.63	8 32 1.9	30 47.5	8.1623	8.9561	3.10	3.81
16 13 59.8	75	13 37 24.40	37 12.16	8 29 50.3	28 34.4	8.1728	8.9651	3.09	3.80
17 13 55.5	76	13 37 2.70	36 50.19	8 27 36.1	26 18.7	8.1828	8.9735	3.08	3.78
18 13 51.1	77	13 36 40.51	36 27.74	8 25 19.2	24 0.4	8.1922	8.9818	3.07	3.76
19 13 46.8	78	13 36 17.85	36 4.82	8 22 59.8	21 39.6	8.2021	8.9895	3.05	3.74
20 13 42.5	79	13 35 54.73	35 41.46	8 20 37.9	19 16.5	8.2097	8.9972	3.03	3.72
21 13 38.2	80	13 35 31.17	35 17.66	8 18 13.6	16 51.0	8.2176	9.0042	3.01	3.70
22 13 33.9	81	13 35 7.19	34 53.45	8 15 47.1	14 23.3	8.2250	9.0104	2.99	3.68
23 13 29.5	82	13 34 42.80	34 28.85	8 13 18.5	11 53.5	8.2322	9.0166	2.97	3.66
24 13 25.2	83	13 34 18.02	34 3.86	8 11 47.9	9 21.8	8.2390	9.0223	2.95	3.64
25 13 20.9	84	13 33 52.86	33 38.50	8 9 15.3	6 48.2	8.2454	9.0277	2.93	3.62
26 13 16.5	85	13 33 27.34	33 12.80	8 5 40.8	4 12.7	8.2513	9.0330	2.91	3.60
27 13 12.1	86	13 33 1.48	32 46.77	8 3 4.5	1 35.6	8.2568	9.0378	2.88	3.58
28 13 7.8	87	13 32 35.31	32 20.43	8 0 26.6	58 56.9	8.2619	9.0420	2.86	3.56
29 13 3.4	88	13 32 8.84	31 53.81	7 57 47.2	56 16.7	8.2667	9.0460	2.83	3.54
30 12 59.0	89	13 31 42.09	31 26.91	7 55 6.4	53 35.2	8.2710	9.0495	2.80	3.51
Apr. 1 12 54.6	90	13 31 15.08	30 59.75	7 52 24.3	50 52.4	8.2752	9.0529	2.77	3.48
2 12 50.2	91	13 30 47.81	30 32.36	7 49 40.9	48 8.4	8.2791	9.0562	2.74	3.45
3 12 45.8	92	13 30 20.31	30 4.75	7 46 56.4	45 23.4	8.2827	9.0591	2.71	3.41
4 12 41.4	93	13 29 52.59	29 36.94	7 41 10.9	39 37.4	8.2858	9.0615	2.68	3.36
5 12 37.0	94	13 29 24.69	29 8.95	7 41 24.5	39 50.6	8.2885	9.0638	2.64	3.30
6 12 32.6	95	13 28 56.64	28 40.81	7 38 37.3	37 3.1	8.2908	9.0656	2.59	3.22
7 12 28.2	96	13 28 28.42	28 12.51	7 35 49.4	34 15.0	8.2930	9.0672	2.53	3.12
8 12 23.8	97	13 28 0.07	27 44.09	7 33 1.0	31 26.4	8.2951	9.0685	2.46	+3.00
9 12 19.4	98	13 27 31.60	27 15.57	7 30 12.1	28 37.4	8.2967	9.0698	2.38	
10 12 15.0	99	13 27 3.02	26 46.96	7 27 22.8	25 48.1	8.2982	9.0706	2.29	
11 12 10.6	100	13 26 34.38	26 18.28	7 24 33.3	22 58.7	8.2992	9.0708	2.17	
12 12 6.2	101	13 26 5.67	25 49.56	7 21 43.8	20 9.3	8.3000	9.0706	-2.02	
13 12 1.8	102	13 25 36.92	25 20.81	7 18 54.4	17 20.0	8.3004	9.0703		
14 11 57.4	103	13 25 8.16	24 52.06	7 16 5.1	14 30.9	8.3004	9.0698		
15 11 53.0	104	13 24 39.41	24 23.33	7 13 16.1	11 42.1	8.3001	9.0690	-2.98	
16 11 48.6	105	13 24 10.67	23 54.63	7 10 27.4	8 53.7	8.2997	9.0680	+2.10	3.10
17 11 44.2	106	13 23 41.98	23 25.98	7 7 39.2	6 5.9	8.2987	9.0664	2.24	3.20
18 11 39.8	107	13 23 13.35	22 57.41	7 4 51.7	3 18.8	8.2978	9.0646	2.34	3.28
19 11 35.4	108	13 22 44.81	22 28.94	7 2 5.0	0 32.6	8.2963	9.0622	2.43	3.35
20 11 31.0	109	13 22 16.37	22 0.58	6 59 19.2	57 47.4	8.2945	9.0597	2.51	3.41
21 11 26.5	110	13 21 48.07	21 32.37	6 56 34.4	55 3.2	8.2923	9.0569	2.58	3.46
22 11 22.1	111	13 21 19.91	21 4.31	6 53 50.8	53 20.2	8.2899	9.0538	2.64	3.50
23 11 17.8	112	13 20 51.93	20 36.44	6 51 8.4	49 38.6	8.2870	9.0502	2.68	3.53
24 11 13.4	113	13 20 24.13	20 8.76	6 48 27.4	46 58.4	8.2841	9.0465	2.72	3.56
25 11 9.0	114	13 19 56.53	19 41.30	6 45 47.8	44 19.8	8.2807	9.0425	2.76	3.59
26 11 4.6	115	13 19 29.16	19 14.07	6 43 9.8	41 42.8	8.2768	9.0378	2.79	3.61
27 11 0.2	116	13 19 2.04	18 47.09	6 40 33.6	39 7.6	8.2729	9.0327	2.82	3.63
28 10 55.8	117	13 18 35.17	18 20.39	6 37 59.1	36 34.3	8.2686	9.0274	2.85	3.66
29 10 51.4	118	13 18 8.58	17 53.98	6 35 26.6	34 2.9	8.2637	9.0220	2.88	3.68
30 10 47.1	119	13 17 42.30	17 27.87	6 32 56.1	31 33.5	8.2585	9.0163	2.90	3.70
31 10 42.7	120	13 17 16.33	17 2.08	6 30 27.6	29 6.3	8.2532	9.0098	2.92	3.72
31 10 38.4	121	13 16 50.68	16 36.63	- 6 28 1.4	26 41.4	-8.2478	+9.0030	+2.94	-3.74

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
May	d h m	d h m s	m s	° ' "	' "				
1	10 38.4	121 13 16 50.68	16 36.63	- 6 28 1.4	26 41.4	-8.2478	+9.0030	+2.94	-3.74
2	10 34.0	122 13 16 25.37	16 11.53	6 25 37.5	24 18.9	8.2418	8.9957	2.96	3.76
3	10 29.7	123 13 16 0.42	15 46.79	6 23 15.9	21 58.7	8.2354	8.9883	2.98	3.78
4	10 25.3	124 13 15 35.84	15 22.43	6 20 56.8	19 41.1	8.2286	8.9806	3.00	3.79
5	10 21.0	125 13 15 11.65	14 58.46	6 18 40.3	17 26.2	8.2227	8.9722	3.01	3.81
6	10 16.7	126 13 14 47.85	14 34.90	6 16 26.5	15 13.9	8.2144	8.9635	3.02	3.82
7	10 12.4	127 13 14 24.47	14 11.76	6 14 15.4	15 4.4	8.2065	8.9546	3.04	3.84
8	10 8.1	128 13 14 1.52	13 49.06	6 12 7.1	10 57.7	8.1982	8.9448	3.05	3.85
9	10 3.8	129 13 13 39.01	13 26.81	6 10 1.7	8 54.0	8.1895	8.9343	3.06	3.87
10	9 59.5	130 13 13 16.96	13 5.02	6 7 59.3	6 53.3	8.1803	8.9236	3.07	3.88
11	9 55.2	131 13 12 55.38	12 43.71	6 6 0.0	4 55.7	8.1708	8.9124	3.08	3.89
12	9 50.9	132 13 12 34.27	12 22.88	6 4 3.8	3 1.3	8.1610	8.9004	3.09	3.90
13	9 46.6	133 13 12 13.66	12 2.55	6 2 10.9	1 10.2	8.1504	8.8877	3.10	3.91
14	9 42.4	134 13 11 53.55	11 42.73	6 0 21.3	59 22.5	8.1392	8.8747	3.11	3.92
15	9 38.1	135 13 11 33.97	11 23.44	5 58 35.0	57 38.1	8.1274	8.8607	3.12	3.93
16	9 33.9	136 13 11 14.92	11 4.69	5 56 52.1	55 57.1	8.1153	8.8463	3.13	3.94
17	9 29.6	137 13 10 56.41	10 46.49	5 55 12.7	54 19.7	8.1026	8.8310	3.14	3.95
18	9 25.4	138 13 10 38.45	10 28.84	5 53 36.9	52 45.9	8.0891	8.8147	3.15	3.96
19	9 21.2	139 13 10 21.05	10 11.75	5 52 4.8	51 15.8	8.0748	8.7973	3.16	3.96
20	9 17.0	140 13 10 4.22	9 55.24	5 50 36.3	49 49.4	8.0602	8.7791	3.16	3.96
21	9 12.8	141 13 9 47.97	9 39.32	5 49 11.5	48 26.7	8.0444	8.7596	3.16	3.97
22	9 8.6	142 13 9 32.32	9 24.00	5 47 50.5	47 7.8	8.0277	8.7392	3.17	3.97
23	9 4.4	143 13 9 17.27	9 9.28	5 46 33.4	45 52.8	8.0101	8.7178	3.17	3.97
24	9 0.2	144 13 9 2.83	8 55.17	5 45 20.2	44 41.7	7.9917	8.6947	3.17	3.98
25	8 56.1	145 13 8 48.99	8 41.67	5 44 10.8	43 34.4	7.9725	8.6703	3.17	3.98
26	8 51.9	146 13 8 35.77	8 28.80	5 43 5.3	42 31.1	7.9525	8.6444	3.18	3.98
27	8 47.8	147 13 8 23.17	8 16.55	5 42 3.8	41 31.8	7.9308	8.6168	3.18	3.98
28	8 43.7	148 13 8 11.20	8 4.92	5 41 6.2	40 36.4	7.9080	8.5867	3.18	3.99
29	8 39.5	149 13 7 59.86	7 53.93	5 40 12.6	39 45.0	7.8838	8.5542	3.18	3.99
30	8 35.4	150 13 7 49.16	7 43.57	5 39 23.0	38 57.6	7.8577	8.5192	3.18	3.99
31	8 31.3	151 13 7 39.10	7 33.85	5 38 37.5	38 14.3	7.8302	8.4801	3.19	3.99
June 1	8 27.3	152 13 7 29.67	7 24.78	5 37 56.0	37 35.0	7.8006	8.4371	3.19	3.99
2	8 23.2	153 13 7 20.89	7 16.35	5 37 18.6	36 59.8	7.7690	8.3894	3.19	3.99
3	8 19.1	154 13 7 12.75	7 8.57	5 36 45.3	36 28.7	7.7346	8.3358	3.19	4.00
4	8 15.1	155 13 7 5.26	7 1.44	5 36 16.0	36 1.7	7.6968	8.2746	3.20	4.00
5	8 11.1	156 13 6 58.42	6 54.96	5 35 50.9	35 38.8	7.6552	8.2033	3.20	4.00
6	8 7.1	157 13 6 52.24	6 49.14	5 35 29.9	35 20.1	7.6088	8.1181	3.20	4.00
7	8 3.1	158 13 6 46.72	6 43.98	5 35 13.1	35 5.5	7.5568	8.0119	3.20	4.00
8	7 59.1	159 13 6 41.86	6 39.48	5 35 0.3	34 55.0	7.4977	7.8710	3.21	4.00
9	7 55.1	160 13 6 37.66	6 35.64	5 34 51.7	34 48.7	7.4293	7.6578	3.21	4.00
10	7 51.1	161 13 6 34.12	6 32.46	5 34 47.2	34 46.5	7.3481	+7.2218	3.21	4.00
11	7 47.1	162 13 6 31.24	6 29.95	5 34 46.9	34 48.5	7.2473	-7.0846	3.21	4.00
12	7 43.1	163 13 6 29.03	6 28.11	5 34 50.7	34 54.6	7.1158	7.6125	3.21	4.00
13	7 39.2	164 13 6 27.49	6 26.93	5 34 58.7	35 4.8	6.9261	7.8437	3.21	4.00
14	7 35.2	165 13 6 26.61	6 26.41	5 35 10.8	35 19.2	-6.5820	7.9939	3.21	4.00
15	7 31.3	166 13 6 26.39	6 26.56	5 35 27.1	35 37.8	+5.9208	8.1053	3.21	4.00
16	7 27.4	167 13 6 26.84	6 27.38	5 35 47.5	36 0.5	6.7420	8.1938	3.21	4.00
17	7 23.5	168 13 6 27.97	6 28.87	5 36 12.0	36 27.3	7.0075	8.2665	3.21	3.99
18	7 19.6	169 13 6 21.77	6 31.02	5 36 40.7	36 58.3	7.1700	8.3287	3.20	3.99
19	7 15.7	170 13 6 32.23	6 33.83	5 37 13.5	37 33.3	7.2880	8.3832	3.20	3.99
20	7 11.8	171 13 6 35.35	6 37.31	5 37 50.4	38 12.4	7.3800	8.4310	3.20	3.99
21	7 8.0	172 13 6 39.13	6 41.46	5 38 31.3	38 55.4	7.4559	8.4741	3.20	3.99
22	7 4.1	173 13 6 43.58	6 46.26	5 39 16.2	39 42.5	7.5201	8.5128	3.20	3.98
23	7 0.3	174 13 6 48.68	6 51.71	5 40 5.2	40 33.6	7.5756	8.5483	3.19	3.98
24	6 56.4	175 13 6 54.42	6 57.82	5 40 58.1	41 28.7	7.6248	8.5812	3.19	3.98
25	6 52.6	176 13 7 0.82	7 4.58	5 41 55.1	42 27.8	7.6690	8.6117	3.19	3.98
26	6 48.8	177 13 7 7.87	7 11.98	5 42 56.0	43 30.8	7.7088	8.6396	3.19	3.98
27	6 45.0	178 13 7 15.55	7 20.02	5 44 0.7	44 37.6	7.7450	8.6657	3.18	3.97
28	6 41.2	179 13 7 23.87	7 28.69	5 45 9.3	45 48.3	7.7781	8.6898	3.18	3.97
29	6 37.4	180 13 7 32.83	7 38.00	5 46 21.7	47 2.8	7.8089	8.7126	3.18	3.97
30	6 33.6	181 13 7 42.42	7 47.93	5 47 37.9	48 21.1	7.8372	8.7340	3.17	3.96
31	6 29.9	182 13 7 52.63	7 58.48	5 48 57.8	49 43.2	+7.8646	-8.7544	+3.17	-3.96

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
July 1 6 29.9	182	13 7 52.63	7 58.48	- 5 46 57.8	49 43.2	+7.8646	-8.7544	+3.17	-3.96
2 6 26.2	183	13 8 3.46	8 9.65	5 50 21.5	51 9.0	7.8884	8.7739	3.17	3.95
3 6 22.4	184	13 8 14.91	8 21.44	5 51 49.0	52 38.5	7.9121	8.7925	3.17	3.95
4 6 18.7	185	13 8 26.97	8 33.84	5 53 20.2	54 11.7	7.9339	8.8101	3.16	3.94
5 6 15.0	186	13 8 39.65	8 46.85	5 54 55.0	55 48.5	7.9550	8.8266	3.16	3.94
6 6 11.3	187	13 8 52.93	9 0.46	5 56 33.4	57 29.0	7.9745	8.8418	3.16	3.93
7 6 7.6	188	13 9 6.81	9 14.68	5 58 15.5	59 13.0	7.9932	8.8577	3.15	3.93
8 6 3.9	189	13 9 21.29	9 29.49	6 0 1.1	1 0.6	8.0113	8.8722	3.15	3.92
9 6 0.2	190	13 9 36.37	9 44.90	6 1 50.2	2 51.8	8.0285	8.8864	3.15	3.92
10 5 56.5	191	13 9 52.04	10 0.90	6 3 42.9	4 56.4	8.0450	8.9000	3.14	3.91
11 5 52.9	192	13 10 8.31	10 17.49	6 5 39.1	6 44.4	8.0607	8.9128	3.14	3.91
12 5 49.2	193	13 10 25.16	10 34.66	6 7 38.6	8 45.9	8.0756	8.9251	3.14	3.90
13 5 45.6	194	13 10 42.59	10 52.41	6 9 41.6	10 50.8	8.0901	8.9371	3.14	3.90
14 5 42.0	195	13 11 0.69	11 10.73	6 11 48.0	12 59.0	8.1037	8.9488	3.13	3.89
15 5 38.3	196	13 11 19.17	11 29.63	6 13 57.7	15 10.5	8.1170	8.9599	3.13	3.89
16 5 34.7	197	13 11 38.31	11 49.09	6 16 10.7	17 25.3	8.1298	8.9706	3.13	3.88
17 5 31.1	198	13 11 58.02	12 9.11	6 18 27.0	18 43.4	8.1425	8.9812	3.12	3.88
18 5 27.5	199	13 12 18.29	12 29.68	6 20 46.5	21 4.7	8.1542	8.9911	3.12	3.87
19 5 24.0	200	13 12 39.11	12 50.80	6 23 9.3	23 29.2	8.1656	9.0009	3.12	3.87
20 5 20.4	201	13 13 0.47	13 12.46	6 25 35.1	25 56.7	8.1767	9.0101	3.11	3.86
21 5 16.8	202	13 13 22.37	13 34.67	6 28 4.0	28 27.3	8.1874	9.0188	3.11	3.86
22 5 13.3	203	13 13 44.82	13 57.41	6 30 35.9	31 0.9	8.1978	9.0274	3.10	3.85
23 5 9.7	204	13 14 7.80	14 20.68	6 33 10.8	33 37.5	8.2077	9.0358	3.10	3.85
24 5 6.3	205	13 14 31.29	14 44.46	6 35 48.7	36 17.0	8.2172	9.0438	3.09	3.84
25 5 2.8	206	13 14 55.30	15 8.76	6 38 29.5	38 59.4	8.2265	9.0516	3.09	3.83
26 4 59.2	207	13 15 19.82	15 33.57	6 41 13.2	41 44.6	8.2355	9.0591	3.08	3.83
27 4 55.7	208	13 15 44.84	15 58.88	6 43 59.6	44 32.7	8.2442	9.0664	3.08	3.82
28 4 52.2	209	13 16 10.37	16 24.69	6 46 48.8	47 23.5	8.2527	9.0735	3.07	3.82
29 4 48.7	210	13 16 36.39	16 50.98	6 49 40.8	50 17.0	8.2609	9.0803	3.07	3.81
30 4 45.2	211	13 17 2.89	17 17.76	6 52 35.4	54 13.2	8.2688	9.0871	3.06	3.80
31 4 41.7	212	13 17 29.88	17 45.02	6 56 32.7	56 12.1	8.2765	9.0935	3.06	3.80
Aug. 1 4 38.2	213	13 17 57.34	18 12.76	6 58 32.6	59 13.5	8.2841	9.0998	3.05	3.79
2 4 34.8	214	13 18 25.28	18 40.97	7 1 35.1	2 17.5	8.2914	9.1060	3.05	3.78
3 4 31.3	215	13 18 53.69	19 9.65	7 4 40.1	5 24.1	8.2986	9.1118	3.04	3.77
4 4 27.9	216	13 19 22.56	19 38.79	7 7 47.7	8 33.2	8.3055	9.1177	3.04	3.76
5 4 24.4	217	13 19 51.89	20 8.38	7 10 57.8	11 44.7	8.3123	9.1233	3.03	3.76
6 4 21.0	218	13 20 21.67	20 38.43	7 14 10.3	14 58.6	8.3188	9.1288	3.03	3.75
7 4 17.6	219	13 20 51.91	21 8.93	7 17 25.2	18 14.9	8.3254	9.1341	3.02	3.74
8 4 14.2	220	13 21 22.60	21 39.88	7 20 42.5	21 33.6	8.3317	9.1392	3.02	3.73
9 4 10.8	221	13 21 53.73	22 11.26	7 24 2.1	24 54.5	8.3378	9.1441	3.01	3.72
10 4 7.4	222	13 22 25.29	22 43.08	7 27 24.0	28 17.7	8.3438	9.1491	3.01	3.72
11 4 4.0	223	13 22 57.29	23 15.33	7 30 48.1	31 43.1	8.3496	9.1538	3.00	3.71
12 4 0.6	224	13 23 29.72	23 48.00	7 34 14.4	35 10.6	8.3552	9.1582	3.00	3.70
13 3 57.2	225	13 24 2.56	24 21.09	7 37 42.7	38 40.3	8.3607	9.1625	2.99	3.69
14 3 53.8	226	13 24 35.82	24 54.60	7 41 13.3	42 12.0	8.3662	9.1669	2.99	3.68
15 3 50.4	227	13 25 9.50	25 28.52	7 44 46.0	45 45.7	8.3715	9.1712	2.98	3.68
16 3 47.1	228	13 25 43.59	26 2.84	7 48 20.6	49 21.4	8.3766	9.1752	2.98	3.67
17 3 43.7	229	13 26 18.07	26 37.56	7 51 57.1	52 59.1	8.3817	9.1791	2.97	3.66
18 3 40.4	230	13 26 52.95	27 12.67	7 55 35.6	56 38.8	8.3866	9.1828	2.97	3.65
19 3 37.0	231	13 27 28.22	27 48.17	7 59 16.0	0 20.3	8.3915	9.1866	2.96	3.64
20 3 33.7	232	13 28 3.87	28 24.05	8 2 58.3	4 3.6	8.3959	9.1901	2.96	3.63
21 3 30.4	233	13 28 39.91	29 0.31	8 6 42.3	7 48.7	8.4005	9.1935	2.95	3.62
22 3 27.0	234	13 29 16.32	29 36.93	8 10 28.1	11 35.6	8.4050	9.1969	2.95	3.61
23 3 23.7	235	13 29 53.09	30 13.92	8 14 15.6	15 24.2	8.4092	9.2001	2.94	3.60
24 3 20.4	236	13 30 30.22	30 51.27	8 18 4.8	19 14.5	8.4133	9.2033	2.93	3.59
25 3 17.1	237	13 31 7.70	31 28.97	8 21 55.7	23 6.3	8.4174	9.2063	2.93	3.58
26 3 13.8	238	13 31 35.53	32 7.01	8 25 48.1	26 59.7	8.4214	9.2094	2.92	3.57
27 3 10.5	239	13 32 23.70	32 45.39	8 29 42.1	30 54.6	8.4254	9.2121	2.92	3.56
28 3 7.2	240	13 33 2.22	33 24.12	8 33 37.5	34 51.0	8.4292	9.2149	2.91	3.55
29 3 3.9	241	13 33 41.08	34 3.19	8 37 34.4	38 48.8	8.4329	9.2174	2.90	3.53
30 3 0.6	242	13 34 20.27	34 42.58	8 41 32.8	42 48.1	8.4365	9.2200	2.90	3.52
31 2 57.4	243	13 34 59.78	35 22.29	8 45 32.5	46 48.8	+8.4401	-9.2225	+2.89	-3.51

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .		
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.	
Sept. 1	d 2 54.1	244	13 35 39.61	13 2.32	- 8 49 33.6	50 50.9	+8.4436	-9.2250	+2.88	-3.50
2	2 50.8	245	13 36 19.76	36 42.67	8 53 36.1	54 54.3	8.4470	9.2274	2.88	3.49
3	2 47.6	246	13 37 0.22	37 23.33	8 57 39.9	58 59.0	8.4503	9.2297	2.87	3.48
4	2 44.3	247	13 37 41.00	38 4.31	9 1 45.0	4 4.9	8.4536	9.2319	2.87	3.47
5	2 41.1	248	13 38 22.09	38 45.59	9 5 51.3	8 11.9	8.4569	9.2339	2.86	3.46
6	2 37.8	249	13 39 3.48	39 27.16	9 9 58.7	11 20.0	8.4600	9.2361	2.86	3.45
7	2 34.6	250	13 39 45.16	40 9.03	9 14 7.2	16 29.3	8.4631	9.2382	2.85	3.44
8	2 31.4	251	13 40 27.14	40 51.20	9 18 16.8	20 39.8	8.4661	9.2400	2.84	3.42
9	2 28.1	252	13 41 9.41	41 33.66	9 22 27.6	24 51.4	8.4691	9.2420	2.84	3.41
10	2 24.9	253	13 41 51.97	42 16.40	9 26 39.5	29 4.0	8.4720	9.2437	2.83	3.40
11	2 21.7	254	13 42 34.81	42 59.41	9 30 52.4	33 17.5	8.4748	9.2452	2.82	3.38
12	2 18.5	255	13 43 17.92	43 42.70	9 35 6.2	37 31.9	8.4775	9.2467	2.81	3.36
13	2 15.3	256	13 44 1.30	44 26.26	9 39 20.9	41 47.3	8.4802	9.2483	2.80	3.34
14	2 12.1	257	13 44 44.95	45 10.08	9 43 36.5	46 3.5	8.4829	9.2498	2.80	3.32
15	2 8.9	258	13 45 28.86	45 54.15	9 47 52.9	50 20.6	8.4854	9.2512	2.79	3.30
16	2 5.7	259	13 46 13.02	46 38.48	9 52 10.2	54 38.3	8.4878	9.2525	2.78	3.28
17	2 2.5	260	13 46 57.42	47 23.05	9 56 28.2	58 56.7	8.4903	9.2537	2.77	3.26
18	1 59.3	261	13 47 42.07	48 7.87	10 0 46.9	2 15.9	8.4926	9.2549	2.76	3.23
19	1 56.1	262	13 48 26.97	48 52.93	10 5 6.2	7 35.8	8.4949	9.2561	2.75	3.20
20	1 53.0	263	13 49 12.10	49 38.21	10 9 26.2	11 56.3	8.4971	9.2571	2.74	3.17
21	1 49.8	264	13 49 57.46	50 23.72	10 13 46.8	16 17.4	8.4994	9.2581	2.73	3.14
22	1 46.6	265	13 50 43.05	51 9.45	10 18 8.0	20 39.0	8.5016	9.2589	2.72	3.11
23	1 43.4	266	13 51 28.85	51 55.40	10 22 29.7	25 1.1	8.5035	9.2597	2.71	3.07
24	1 40.3	267	13 52 14.87	52 41.56	10 26 51.9	29 23.7	8.5056	9.2606	2.70	3.03
25	1 37.1	268	13 53 1.10	53 27.93	10 31 14.5	33 46.7	8.5075	9.2612	2.69	-2.98
26	1 33.9	269	13 53 47.53	54 14.50	10 35 37.6	38 10.2	8.5094	9.2619	2.68	
27	1 30.8	270	13 54 34.16	55 1.27	10 40 1.1	42 34.0	8.5112	9.2626	2.67	
28	1 27.6	271	13 55 20.98	55 48.23	10 44 24.9	46 58.2	8.5130	9.2632	2.66	
29	1 24.5	272	13 56 8.00	56 35.39	10 48 49.1	51 22.7	8.5148	9.2637	2.65	
30	1 21.3	273	13 56 55.21	57 22.74	10 53 13.6	55 47.4	8.5165	9.2642	2.64	
Oct. 1	1 18.2	274	13 57 42.61	58 10.27	10 57 38.3	59 12.4	8.5182	9.2645	2.63	
2	1 15.1	275	13 58 30.19	58 57.98	11 1 3.2	4 37.6	8.5198	9.2648	2.62	
3	1 11.9	276	13 59 17.95	59 45.87	11 6 28.4	9 3.0	8.5214	9.2651	2.60	
4	1 8.8	277	14 0 5.88	0 33.93	11 10 53.7	13 28.6	8.5229	9.2655	2.59	
5	1 5.7	278	14 0 53.98	1 22.16	11 15 19.2	17 54.3	8.5244	9.2656	2.58	
6	1 2.5	279	14 1 42.25	2 10.56	11 19 44.8	22 20.1	8.5259	9.2658	2.56	
7	0 59.4	280	14 2 30.69	2 59.12	11 24 10.5	26 45.9	8.5274	9.2659	2.55	
8	0 56.3	281	14 3 19.29	3 47.83	11 28 36.2	31 11.7	8.5288	9.2659	2.53	
9	0 53.2	282	14 4 8.04	4 36.69	11 33 1.8	35 37.4	8.5302	9.2658	2.52	
10	0 50.0	283	14 4 56.93	5 25.70	11 37 27.4	39 3.1	8.5314	9.2656	2.51	
11	0 46.9	284	14 5 45.97	6 14.85	11 41 52.9	44 38.7	8.5328	9.2655	2.49	
12	0 43.8	285	14 6 35.15	7 4.14	11 46 18.3	48 54.3	8.5340	9.2653	2.48	
13	0 40.7	286	14 7 24.46	7 53.55	11 50 43.6	53 19.7	8.5350	9.2651	2.46	
14	0 37.6	287	14 8 13.90	8 43.09	11 55 8.7	57 44.9	8.5362	9.2648	2.45	+2.93
15	0 34.5	288	14 9 3.46	9 32.75	11 59 33.6	2 9.9	8.5373	9.2645	2.43	2.98
16	0 31.4	289	14 9 53.14	10 22.52	12 3 58.3	5 34.6	8.5383	9.2642	2.42	3.02
17	0 28.3	290	14 10 42.93	11 12.41	12 8 22.8	10 59.0	8.5392	9.2637	2.40	3.05
18	0 25.2	291	14 11 32.83	12 2.40	12 12 46.9	15 22.9	8.5401	9.2631	2.38	3.08
19	0 22.1	292	14 12 22.83	12 52.48	12 17 10.5	19 46.5	8.5410	9.2624	2.37	3.10
20	0 19.0	293	14 13 12.93	13 42.66	12 21 33.8	25 9.8	8.5417	9.2618	2.35	3.12
21	0 15.9	294	14 14 3.12	14 32.93	12 25 56.7	29 32.6	8.5426	9.2610	2.33	-3.14
22	0 12.8	295	14 14 53.40	15 23.29	12 30 19.2	33 54.9	8.5434	9.2604	2.31	3.15
23	0 9.7	296	14 15 43.76	16 13.73	12 34 41.2	38 16.8	8.5440	9.2595	2.29	3.16
24	0 6.6	297	14 16 34.20	17 4.24	12 39 2.8	42 38.2	8.5446	9.2587	2.27	3.18
25	0 3.5	298	14 17 24.71	17 54.83	12 43 23.8	45 59.0	8.5452	9.2577	2.25	3.20
26	0 0.4	299	14 18 15.29	18 45.48	12 47 44.2	51 19.2	8.5459	9.2568	2.22	3.21
26 23 57.3	300	14 19 5.94	19 36.19	12 52 4.0	55 38.9		8.5465	9.2558	2.19	3.22
27 23 54.2	301	14 19 56.65	20 26.96	12 56 23.3	59 58.0		8.5470	9.2547	2.16	3.23
28 23 51.2	302	14 20 47.41	21 17.79	13 1 41.9	4 16.4		8.5474	9.2537	2.12	3.25
29 23 48.1	303	14 21 38.23	22 8.67	13 4 59.9	8 34.1		8.5478	9.2525	2.08	3.26
30 23 45.0	304	14 22 29.10	22 59.60	13 9 17.2	12 51.1		8.5483	9.2513	2.03	3.27
31 23 41.9	305	14 23 20.02	23 50.57	-13 13 33.7	16 7.3		+8.5486	-9.2500	+1.96	+3.28

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Nov. 1 23 38.8	306	14 24 10.97	24 41.58	-13 17 49.5	20 22.7	+8.5489	-9.2491		+3.29
2 23 35.7	307	14 25 1.96	25 32.62	13 22 4.5	24 37.4	8.5493	9.2473		3.31
8 23 32.7	308	14 25 52.98	26 23.69	13 26 18.6	28 51.2	8.5495	9.2459		3.32
4 23 29.6	309	14 26 44.03	27 14.79	13 30 31.9	33 4.2	8.5497	9.2445		3.33
5 23 26.5	310	14 27 35.10	28 5.91	13 34 44.4	37 16.3	8.5499	9.2430		3.34
6 23 23.4	311	14 28 26.20	28 57.04	13 38 56.0	41 27.5	8.5500	9.2415		3.35
7 23 20.3	312	14 29 17.31	29 48.17	13 43 6.6	45 37.7	8.5501	9.2398		3.37
8 23 17.3	313	14 30 8.42	30 39.30	13 47 16.3	49 47.0	8.5500	9.2382		3.38
9 23 14.2	314	14 30 59.52	31 30.43	13 51 25.1	53 55.2	8.5500	9.2365		3.39
10 23 11.1	315	14 31 50.61	32 21.55	13 55 32.7	58 2.4	8.5499	9.2347		3.40
11 23 8.0	316	14 32 41.69	33 12.65	13 59 39.3	2 8.5	8.5498	9.2329		3.41
12 23 4.9	317	14 33 32.75	34 3.73	14 3 44.9	6 13.5	8.5496	9.2310		3.42
13 23 1.8	318	14 34 23.79	34 54.78	14 7 49.5	10 17.5	8.5494	9.2290		3.43
14 22 58.8	319	14 35 14.80	35 45.80	14 11 52.9	14 20.4	8.5491	9.2270	-1.96	3.44
15 22 55.7	320	14 36 5.77	36 36.78	14 15 55.2	18 22.1	8.5487	9.2248	2.03	3.45
16 22 52.6	321	14 36 56.70	37 27.71	14 19 56.3	22 22.6	8.5483	9.2227	2.08	3.46
17 22 49.5	322	14 37 47.58	38 18.59	14 23 56.2	26 21.8	8.5479	9.2206	2.12	3.47
18 22 46.4	323	14 38 38.41	39 9.42	14 27 54.9	30 19.8	8.5475	9.2182	2.16	3.48
19 22 43.3	324	14 39 29.19	40 0.19	14 31 52.3	34 16.5	8.5470	9.2158	2.19	3.49
20 22 40.2	325	14 40 19.91	40 50.89	14 35 48.3	38 11.9	8.5465	9.2134	2.22	3.50
21 22 37.1	326	14 41 10.55	41 41.51	14 39 43.1	42 6.0	8.5458	9.2110	2.25	3.50
22 22 34.0	327	14 42 1.11	42 32.06	14 43 36.5	45 58.8	8.5451	9.2086	2.28	3.51
23 22 30.9	328	14 42 51.60	43 22.53	14 47 28.6	49 50.2	8.5441	9.2059	2.31	3.52
24 22 27.9	329	14 43 42.01	44 12.91	14 51 19.3	53 40.2	8.5436	9.2033	2.34	3.53
25 22 24.8	330	14 44 32.32	45 3.20	14 55 8.6	57 28.9	8.5428	9.2007	2.36	3.54
26 22 21.7	331	14 45 22.54	45 53.40	14 58 56.6	1 16.1	8.5420	9.1976	2.38	3.54
27 22 18.6	332	14 46 12.67	46 43.49	15 2 43.1	5 1.9	8.5413	9.1951	2.41	3.55
28 22 15.5	333	14 47 2.70	47 33.47	15 6 28.2	8 46.2	8.5403	9.1924	2.43	3.56
29 22 12.4	334	14 47 52.62	48 23.44	15 10 11.8	12 29.0	8.5393	9.1895	2.46	3.57
30 22 9.3	335	14 48 42.42	49 13.09	15 13 53.9	16 10.3	8.5384	9.1866	2.48	3.58
Dec. 1 22 6.2	336	14 49 32.09	50 2.72	15 17 34.4	19 50.0	8.5372	9.1836	2.50	3.58
2 22 3.0	337	14 50 21.64	50 52.22	15 20 13.4	23 28.2	8.5360	9.1807	2.53	3.59
3 21 59.9	338	14 51 11.06	51 41.58	15 24 50.9	27 4.8	8.5348	9.1775	2.55	3.59
4 21 56.8	339	14 52 0.33	52 30.79	15 28 26.8	30 39.8	8.5336	9.1742	2.57	3.60
5 21 53.7	340	14 52 49.46	53 19.85	15 32 1.1	34 13.2	8.5322	9.1710	2.59	3.60
6 21 50.6	341	14 53 38.44	54 8.76	15 35 33.7	37 44.9	8.5309	9.1675	2.61	3.61
7 21 47.4	342	14 54 27.26	54 57.51	15 39 4.7	41 14.9	8.5294	9.1640	2.63	3.61
8 21 44.3	343	14 55 15.91	55 46.09	15 42 34.0	44 43.3	8.5278	9.1605	2.65	3.62
9 21 41.2	344	14 56 4.39	56 34.48	15 46 1.6	48 10.0	8.5263	9.1570	2.67	3.63
10 21 38.1	345	14 56 52.69	57 22.70	15 49 27.4	51 34.9	8.5247	9.1534	2.68	3.64
11 21 34.9	346	14 57 40.80	58 10.72	15 52 51.5	54 58.1	8.5230	9.1497	2.69	3.64
12 21 31.8	347	14 58 28.72	58 58.53	15 56 13.9	58 19.5	8.5212	9.1459	2.71	3.65
13 21 28.6	348	14 59 16.43	59 46.13	15 59 34.6	1 39.1	8.5193	9.1421	2.73	3.65
14 21 25.5	349	15 0 3.93	0 33.52	16 2 53.4	4 56.9	8.5174	9.1381	2.74	3.66
15 21 22.4	350	15 0 51.21	1 20.69	16 6 10.4	8 12.8	8.5153	9.1341	2.75	3.66
16 21 19.2	351	15 1 38.28	2 7.64	16 9 25.6	11 26.9	8.5133	9.1298	2.76	3.66
17 21 16.1	352	15 2 25.12	2 54.36	16 12 38.9	14 30.1	8.5111	9.1256	2.77	3.66
18 21 12.9	353	15 3 11.72	3 40.84	16 15 50.3	17 49.5	8.5088	9.1213	2.78	3.67
19 21 9.7	354	15 3 58.08	4 27.07	16 18 59.9	20 58.0	8.5066	9.1170	2.79	3.67
20 21 6.6	355	15 4 44.20	5 13.05	16 22 7.6	23 4.5	8.5043	9.1125	2.80	3.67
21 21 3.4	356	15 5 30.06	5 58.77	16 25 13.3	27 9.1	8.5018	9.1080	2.81	3.67
22 21 0.2	357	15 6 15.66	6 44.23	16 28 17.1	30 11.8	8.4993	9.1036	2.82	3.67
23 20 57.0	358	15 7 0.99	7 29.42	16 31 19.0	33 12.5	8.4967	9.0990	2.83	3.67
24 20 53.9	359	15 7 46.05	8 14.34	16 34 18.9	36 11.3	8.4940	9.0942	2.84	3.68
25 20 50.7	360	15 8 30.84	8 58.97	16 37 16.8	39 8.1	8.4914	9.0893	2.85	3.68
26 20 47.5	361	15 9 15.35	9 43.31	16 40 12.7	42 2.9	8.4886	9.0843	2.86	3.68
27 20 44.3	362	15 9 59.56	10 27.36	16 43 6.6	44 55.6	8.4857	9.0793	2.87	3.68
28 20 41.1	363	15 10 43.47	11 11.11	16 45 58.5	47 46.3	8.4827	9.0742	2.88	3.68
29 20 37.9	364	15 11 27.08	11 54.54	16 48 48.4	50 35.0	8.4796	9.0690	2.89	3.69
30 20 34.7	365	15 12 10.38	12 37.65	16 51 36.2	53 21.7	8.4765	9.0638	2.90	3.69
31 20 31.4	366	15 12 53.36	13 20.44	16 54 22.0	56 6.2	8.4731	9.0582	2.90	3.69
32 20 28.2	367	15 13 36.01	14 2.90	-16 57 5.6	58 48.5	+8.4698	-9.0527	-2.91	+3.69

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Jan. d h m	d	h m s	m s	° ' "	° ' "				
0 17 41.1	0	12 23 21.19	23 24.23	- 0 0 0.3	0 10.4	+7.6176	-8.146	-2.97	+3.79
1 17 37.3	1	12 23 26.97	23 29.81	0 0 19.2	0 28.0	7.5890	8.087	2.97	3.79
2 17 33.4	2	12 23 32.37	23 35.01	0 0 35.5	0 43.0	7.5581	8.019	2.97	3.79
3 17 29.6	3	12 23 37.38	23 39.82	0 0 49.3	0 55.5	7.5242	7.939	2.97	3.79
4 17 25.7	4	12 23 42.00	23 44.24	0 1 0.5	1 5.4	7.4876	7.839	2.97	3.79
5 17 21.9	5	12 23 46.23	23 48.26	0 1 9.2	1 12.7	7.4469	7.711	2.97	3.79
6 17 18.0	6	12 23 50.06	23 51.89	0 1 15.3	1 17.5	7.4021	7.523	2.97	3.79
7 17 14.1	7	12 23 53.50	23 55.13	0 1 18.8	1 19.7	7.3529	-7.184	2.98	3.79
8 17 10.2	8	12 23 56.55	23 57.97	0 1 19.7	1 19.3	7.2965	+6.386	2.98	3.79
9 17 6.3	9	12 23 59.20	24 0.41	0 1 18.1	1 16.3	7.2308	7.304	2.98	3.79
10 17 2.4	10	12 24 1.45	24 2.45	0 1 13.9	1 10.7	7.1534	7.582	2.98	3.79
11 16 58.5	11	12 24 3.30	24 4.09	0 1 7.1	1 2.6	7.0591	7.747	2.98	3.79
12 16 54.6	12	12 24 4.75	24 5.34	0 0 57.8	0 52.0	6.9386	7.865	2.98	3.79
13 16 50.6	13	12 24 5.80	24 6.19	0 0 46.0	0 38.8	6.7711	7.959	2.98	3.79
14 16 46.7	14	12 24 6.45	24 6.64	0 0 31.6	0 23.1	6.4949	8.038	2.98	3.79
15 16 42.8	15	12 24 6.70	24 6.68	- 0 0 14.6	0 4.8	+5.5406	8.104	2.98	3.78
16 16 38.9	16	12 24 6.55	24 6.32	+ 0 0 5.0	0 16.1	-6.3857	8.161	2.98	3.78
17 16 34.9	17	12 24 6.00	24 5.57	0 0 27.1	0 39.5	6.7138	8.210	2.98	3.78
18 16 30.9	18	12 24 5.06	24 4.42	0 0 51.7	1 5.4	6.8985	8.254	2.98	3.78
19 16 27.0	19	12 24 3.72	24 2.88	0 1 18.8	1 33.8	7.0292	8.294	2.98	3.78
20 16 23.0	20	12 24 1.98	24 0.94	0 1 48.4	2 4.7	7.1283	8.331	2.98	3.77
21 16 19.0	21	12 23 59.85	23 58.60	0 2 20.5	2 38.0	7.2090	8.364	2.97	3.77
22 16 15.0	22	12 23 57.32	23 55.86	0 2 55.0	3 13.8	7.2778	8.395	2.97	3.77
23 16 11.0	23	12 23 54.39	23 52.73	0 3 32.0	3 52.0	7.3365	8.424	2.97	3.76
24 16 7.0	24	12 23 51.07	23 49.22	0 4 11.4	4 32.6	7.3869	8.450	2.97	3.76
25 16 3.0	25	12 23 47.37	23 45.32	0 4 53.2	5 15.6	7.4316	8.475	2.96	3.76
26 15 59.0	26	12 23 43.29	23 41.03	0 5 37.4	6 1.0	7.4726	8.490	2.96	3.75
27 15 55.0	27	12 23 38.82	23 36.36	0 6 24.0	6 48.8	7.5100	8.521	2.96	3.75
28 15 51.0	28	12 23 33.97	23 31.32	0 7 12.9	7 39.0	7.5436	8.541	2.96	3.74
29 15 47.0	29	12 23 28.75	23 25.91	0 8 4.2	8 31.5	7.5744	8.561	2.96	3.74
30 15 43.0	30	12 23 23.16	23 20.13	0 8 57.7	9 26.2	7.6032	8.579	2.96	3.73
31 15 39.0	31	12 23 17.20	23 13.98	0 9 53.5	10 23.2	7.6302	8.597	2.96	3.72
Feb. 1 15 34.9	32	12 23 10.87	23 7.46	0 10 51.6	11 22.4	7.6556	8.614	2.94	3.71
2 15 30.9	33	12 23 4.17	23 0.57	0 11 51.9	12 23.8	7.6792	8.629	2.94	3.71
3 15 26.8	34	12 22 57.11	22 53.32	0 12 54.3	13 27.3	7.7014	8.644	2.93	3.70
4 15 22.8	35	12 22 49.69	22 45.72	0 13 58.9	14 33.0	7.7222	8.659	2.93	3.70
5 15 18.7	36	12 22 41.92	22 37.77	0 15 5.6	15 40.8	7.7417	8.673	2.92	3.69
6 15 14.7	37	12 22 33.83	22 29.47	0 16 14.4	16 50.7	7.7605	8.686	2.92	3.69
7 15 10.6	38	12 22 25.33	22 20.83	0 17 25.3	18 2.7	7.7782	8.698	2.91	3.68
8 15 6.5	39	12 22 16.52	22 11.85	0 18 38.2	19 16.7	7.7950	8.711	2.91	3.67
9 15 2.4	40	12 22 7.37	22 2.53	0 19 53.2	20 32.7	7.8111	8.722	2.91	3.67
10 14 58.3	41	12 21 57.88	21 52.87	0 21 10.2	21 50.7	7.8264	8.733	2.90	3.66
11 14 54.2	42	12 21 48.06	21 42.88	0 22 29.1	23 10.6	7.8408	8.744	2.90	3.65
12 14 50.1	43	12 21 37.92	21 32.57	0 23 49.9	24 32.3	7.8545	8.754	2.89	3.64
13 14 46.0	44	12 21 27.46	21 21.95	0 25 12.5	25 55.8	7.8678	8.763	2.88	3.63
14 14 41.9	45	12 21 16.68	21 11.02	0 26 36.9	27 21.1	7.8805	8.773	2.87	3.62
15 14 37.8	46	12 21 5.59	20 59.78	0 28 3.1	28 48.2	7.8924	8.781	2.86	3.61
16 14 33.7	47	12 20 54.20	20 48.23	0 29 31.0	30 17.0	7.9040	8.790	2.85	3.60
17 14 29.6	48	12 20 42.50	20 36.38	0 31 0.6	31 47.4	7.9152	8.798	2.84	3.59
18 14 25.4	49	12 20 30.51	20 24.24	0 32 31.8	33 19.4	7.9255	8.806	2.83	3.58
19 14 21.3	50	12 20 18.24	20 11.82	0 34 4.6	34 53.0	7.9354	8.813	2.82	3.57
20 14 17.1	51	12 20 5.69	19 59.14	0 35 39.0	36 28.1	7.9448	8.820	2.81	3.55
21 14 13.0	52	12 19 52.88	19 46.30	0 37 14.9	38 4.7	7.9536	8.827	2.80	3.54
22 14 8.8	53	12 19 39.81	19 33.00	0 38 52.2	39 42.7	7.9622	8.833	2.79	3.52
23 14 4.6	54	12 19 26.48	19 19.54	0 40 30.9	41 22.1	7.9705	8.839	2.77	3.50
24 14 0.5	55	12 19 12.90	19 5.84	0 42 10.9	43 2.7	7.9784	8.844	2.76	3.48
25 13 56.3	56	12 18 59.08	18 51.90	0 43 52.1	44 44.5	7.9857	8.849	2.74	3.46
26 13 52.2	57	12 18 45.03	18 37.73	0 45 34.5	46 27.5	7.9929	8.854	2.73	3.44
27 13 48.0	58	12 18 30.75	18 23.34	0 47 18.0	48 11.5	7.9995	8.859	2.71	3.42
28 13 43.8	59	12 18 16.26	18 8.75	0 49 2.6	49 56.6	8.0057	8.863	2.70	3.40
29 13 39.7	60	12 18 1.57	17 53.96	0 50 48.3	51 42.8	8.0116	8.868	2.69	3.38
30 13 35.5	61	12 17 46.68	17 38.97	+ 0 52 35.0	53 30.0	-8.0174	+8.872	-2.67	+3.35

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Data.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. 1 13 39.7	60	12 18 1.57	17 53.96	+ 0 50' 45.3	51' 42.8	-8.0116	+8.868	-2.69	+3.38
2 13 35.5	61	12 17 46.68	17 38.97	0 52 35.0	53 30.0	8.0174	8.872	2.67	3.35
3 13 31.3	62	12 17 31.59	17 23.79	0 54 22.7	55 18.2	8.0229	8.876	2.65	3.32
4 13 27.1	63	12 17 16.32	17 8.43	0 56 11.3	57 7.2	8.0280	8.879	2.63	3.29
5 13 22.9	64	12 17 0.87	16 52.90	0 58 0.7	58 57.0	8.0329	8.882	2.61	3.26
6 13 18.7	65	12 16 45.25	16 37.20	0 59 50.8	60 47.5	8.0375	8.885	2.59	3.22
7 13 14.5	66	12 16 29.47	16 21.34	1 1 41.7	2 38.7	8.0419	8.888	2.57	3.18
8 13 10.3	67	12 16 13.53	16 5.33	1 3 33.3	4 30.6	8.0460	8.890	2.55	3.14
9 13 6.1	68	12 15 57.45	15 49.18	1 5 25.5	6 23.1	8.0498	8.893	2.52	3.09
10 13 1.9	69	12 15 41.23	15 32.90	1 7 18.2	8 16.1	8.0533	8.895	2.49	3.03
11 12 57.7	70	12 15 24.89	15 16.50	1 9 11.4	10 9.5	8.0565	8.896	2.46	2.96
12 12 53.5	71	12 15 8.43	14 59.99	1 11 5.0	12 3.3	8.0595	8.898	2.42	2.88
13 12 49.3	72	12 14 51.86	14 43.37	1 12 50.0	13 57.4	8.0624	8.899	2.38	2.79
14 12 45.1	73	12 14 35.18	14 26.64	1 14 53.3	15 51.8	8.0650	8.900	2.34	+2.68
15 12 40.9	74	12 14 18.41	14 9.83	1 16 47.9	17 46.4	8.0672	8.901	2.29	
16 12 36.7	75	12 14 1.56	13 52.94	1 18 42.6	19 41.1	8.0693	8.901	2.23	
17 12 32.5	76	12 13 44.63	13 35.98	1 20 37.4	21 35.9	8.0711	8.902	2.16	
18 12 28.3	77	12 13 27.64	13 18.97	1 22 32.2	23 30.7	8.0725	8.902	2.08	
19 12 24.1	78	12 13 10.60	13 1.91	1 24 27.0	25 25.5	8.0737	8.902	1.99	
20 12 19.8	79	12 12 53.51	12 44.81	1 26 21.8	27 20.2	8.0748	8.901	1.86	
21 12 15.6	80	12 12 36.39	12 27.68	1 28 16.5	29 14.7	8.0754	8.901	-1.68	-2.68
22 12 11.4	81	12 12 19.25	12 10.53	1 30 10.9	31 9.0	8.0758	8.899		2.82
23 12 7.2	82	12 12 2.10	11 53.38	1 32 5.0	33 2.9	8.0759	8.898		2.92
24 12 3.0	83	12 11 44.95	11 36.24	1 33 58.7	34 56.4	8.0759	8.897		2.98
25 11 58.7	84	12 11 27.80	11 19.10	1 35 52.0	36 49.4	8.0756	8.895		3.03
26 11 54.5	85	12 11 10.67	11 1.98	1 37 44.9	38 41.9	8.0751	8.893	+1.68	3.07
27 11 50.3	86	12 10 53.56	10 44.89	1 39 37.2	40 33.9	8.0745	8.891	1.86	3.11
28 11 46.1	87	12 10 36.48	10 27.83	1 41 28.9	42 25.3	8.0736	8.888	1.99	3.15
29 11 41.9	88	12 10 19.44	10 10.82	1 43 19.9	44 16.0	8.0723	8.886	2.08	3.18
30 11 37.6	89	12 10 2.46	9 53.87	1 45 10.3	46 6.0	8.0708	8.883	2.16	3.22
31 11 33.4	90	12 9 45.54	9 36.99	1 47 0.0	47 55.2	8.0691	8.880	2.23	3.25
Apr. 1 11 29.2	91	12 9 28.69	9 20.18	1 48 48.9	49 43.6	8.0672	8.877	2.29	3.28
2 11 25.0	92	12 9 11.92	9 3.46	1 50 36.9	51 31.2	8.0650	8.873	2.34	3.31
3 11 20.8	93	12 8 55.24	8 46.83	1 52 24.0	53 17.9	8.0627	8.870	2.38	3.34
4 11 16.6	94	12 8 38.65	8 30.30	1 54 10.2	55 3.6	8.0602	8.866	2.41	3.37
5 11 12.4	95	12 8 22.16	8 13.87	1 55 55.4	56 48.2	8.0574	8.861	2.44	3.40
6 11 8.2	96	12 8 5.78	7 57.55	1 57 39.4	58 31.6	8.0544	8.856	2.47	3.42
7 11 4.0	97	12 7 49.52	7 41.36	1 59 22.3	60 13.9	8.0510	8.851	2.50	3.44
8 10 59.8	98	12 7 33.39	7 25.30	2 1 4.0	1 54.9	8.0474	8.846	2.53	3.46
9 10 55.6	99	12 7 17.40	7 9.38	2 2 44.5	3 34.7	8.0436	8.841	2.56	3.48
10 10 51.4	100	12 7 1.55	6 53.61	2 4 23.7	5 13.2	8.0395	8.835	2.58	3.50
11 10 47.2	101	12 6 45.86	6 38.00	2 6 1.6	6 50.4	8.0350	8.829	2.60	3.52
12 10 43.0	102	12 6 30.33	6 22.56	2 7 38.1	8 26.2	8.0306	8.823	2.62	3.54
13 10 38.8	103	12 6 14.96	6 7.29	2 9 13.1	10 0.4	8.0258	8.816	2.64	3.56
14 10 34.6	104	12 5 59.77	5 52.19	2 10 46.7	11 33.1	8.0206	8.809	2.66	3.58
15 10 30.4	105	12 5 44.76	5 37.28	2 12 18.7	13 4.3	8.0151	8.802	2.68	3.59
16 10 26.3	106	12 5 29.95	5 22.57	2 13 49.1	14 33.9	8.0091	8.794	2.69	3.60
17 10 22.1	107	12 5 15.35	5 8.07	2 15 17.9	16 1.9	8.0029	8.786	2.71	3.61
18 10 17.9	108	12 5 0.96	4 53.79	2 16 45.0	17 28.2	7.9965	8.777	2.72	3.62
19 10 13.8	109	12 4 46.78	4 39.73	2 18 10.4	18 52.7	7.9899	8.769	2.74	3.63
20 10 9.6	110	12 4 32.83	4 25.90	2 19 34.1	20 15.5	7.9826	8.760	2.75	3.64
21 10 5.4	111	12 4 19.11	4 12.30	2 20 56.0	21 36.5	7.9753	8.750	2.77	3.65
22 10 1.3	112	12 4 5.62	3 58.94	2 22 16.0	22 55.6	7.9676	8.740	2.79	3.66
23 9 57.1	113	12 3 52.38	3 45.83	2 23 34.1	24 12.7	7.9592	8.729	2.80	3.66
24 9 53.0	114	12 3 39.40	3 32.98	2 24 50.3	25 27.8	7.9505	8.718	2.81	3.67
25 9 48.8	115	12 3 26.68	3 20.39	2 26 4.5	26 41.0	7.9417	8.706	2.82	3.68
26 9 44.7	116	12 3 14.22	3 8.07	2 27 16.7	27 52.3	7.9324	8.694	2.83	3.69
27 9 40.6	117	12 3 2.03	2 56.02	2 28 27.0	29 1.6	7.9226	8.682	2.84	3.69
28 9 36.4	118	12 2 50.12	2 44.25	2 29 35.3	30 8.8	7.9124	8.669	2.84	3.70
29 9 32.3	119	12 2 38.49	2 32.77	2 30 41.5	31 13.9	7.9018	8.656	2.85	3.70
30 9 28.2	120	12 2 27.15	2 21.57	2 31 45.6	32 16.9	7.8909	8.641	2.85	3.71
31 9 24.1	121	12 2 16.09	2 10.66	+ 2 32 47.6	33 17.8	-7.8797	+8.626	+2.85	-3.71

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .		
		At Sidereal Oh.	At Transit.	At Sidappal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.	
May	d h m	d h m s	m s	+ ° ' "	' "					
1	9 24.1	121	12 2 16.09	2 10.66	2 32 47.6	33 17.8	-7.8797	+8.626	+2.85	-3.71
2	9 20.0	122	12 2 5.32	2 0.04	2 33 47.4	34 16.5	7.8680	8.610	2.86	3.71
3	9 15.9	123	12 1 54.84	1 49.71	2 34 45.0	35 13.0	7.8557	8.594	2.86	3.72
4	9 11.8	124	12 1 44.66	1 39.69	2 35 40.4	36 7.3	7.8425	8.576	2.87	3.72
5	9 7.7	125	12 1 34.80	1 29.98	2 36 33.6	36 59.4	7.8286	8.558	2.87	3.73
6	9 3.6	126	12 1 25.25	1 20.59	2 37 24.6	37 49.2	7.8143	8.539	2.88	3.73
7	8 59.5	127	12 1 16.02	1 11.52	2 38 13.3	38 36.7	7.7992	8.519	2.88	3.73
8	8 55.4	128	12 1 7.11	1 2.77	2 38 59.7	39 22.0	7.7834	8.497	2.89	3.74
9	8 51.4	129	12 0 58.53	0 54.35	2 39 43.8	40 5.0	7.7669	8.475	2.90	3.74
10	8 47.3	130	12 0 50.27	0 46.26	2 40 25.6	40 45.6	7.7499	8.451	2.90	3.75
11	8 43.2	131	12 0 42.34	0 38.50	2 41 5.1	41 23.9	7.7315	8.425	2.91	3.75
12	8 39.2	132	12 0 34.75	0 31.08	2 41 42.2	41 59.8	7.7120	8.397	2.91	3.75
13	8 35.1	133	12 0 27.50	0 24.00	2 42 17.0	42 33.4	7.6914	8.368	2.92	3.76
14	8 31.1	134	12 0 20.60	0 17.27	2 42 49.4	43 4.6	7.6697	8.336	2.92	3.76
15	8 27.0	135	12 0 14.04	0 10.89	2 43 19.4	43 33.4	7.6468	8.300	2.93	3.76
16	8 23.0	136	12 0 7.83	0 4.85	2 43 46.9	43 59.7	7.6227	8.261	2.93	3.76
17	8 19.0	137	11 60 1.96	59 59.16	2 44 11.9	44 23.5	7.5967	8.218	2.93	3.77
18	8 14.9	138	11 59 56.45	59 53.83	2 44 34.5	44 44.9	7.5684	8.172	2.94	3.77
19	8 10.9	139	11 59 51.30	59 48.86	2 44 54.7	45 3.9	7.5380	8.119	2.94	3.77
20	8 6.9	140	11 59 46.51	59 44.25	2 45 12.4	45 20.4	7.5053	8.058	2.94	3.77
21	8 2.9	141	11 59 42.08	59 40.00	2 45 27.6	45 34.4	7.4695	7.988	2.94	3.78
22	7 58.9	142	11 59 38.02	59 36.12	2 45 40.4	45 46.0	7.4305	7.906	2.95	3.78
23	7 54.9	143	11 59 34.32	59 32.61	2 45 50.8	45 55.1	7.3876	7.803	2.95	3.78
24	7 50.9	144	11 59 30.99	59 29.46	2 45 58.7	46 1.7	7.3395	7.665	2.95	3.78
25	7 46.9	145	11 59 28.02	59 26.68	2 46 4.1	46 5.9	7.2865	7.460	2.95	3.78
26	7 43.0	146	11 59 25.42	59 24.27	2 46 7.0	46 7.6	7.2246	+7.059	2.95	3.78
27	7 39.0	147	11 59 23.19	59 22.22	2 46 7.4	46 6.8	7.1523	-6.771	2.95	3.78
28	7 35.1	148	11 59 21.33	59 20.54	2 46 5.3	46 3.5	7.0657	7.360	2.95	3.78
29	7 31.1	149	11 59 19.84	59 19.23	2 46 0.8	45 57.7	6.9572	7.601	2.95	3.78
30	7 27.2	150	11 59 18.72	59 18.29	2 45 53.8	45 49.4	6.8124	7.758	2.95	3.78
31	7 23.3	151	11 59 17.97	59 17.72	2 45 44.3	45 38.7	6.5987	7.871	2.95	3.78
June	1 7 19.3	152	11 59 17.59	59 17.53	2 45 32.4	45 25.5	-6.1317	7.959	2.95	3.77
2	7 15.4	153	11 59 17.58	59 17.71	2 45 18.1	45 9.9	+6.0721	8.033	2.95	3.77
3	7 11.5	154	11 59 17.93	59 18.25	2 45 1.3	44 51.9	6.5700	8.097	2.95	3.77
4	7 7.6	155	11 59 18.65	59 19.16	2 44 42.1	44 31.5	6.7983	8.152	2.95	3.77
5	7 3.7	156	11 59 19.74	59 20.44	2 44 20.4	44 8.6	6.9522	8.201	2.95	3.77
6	6 59.8	157	11 59 21.21	59 22.09	2 43 56.3	43 43.3	7.0604	8.246	2.95	3.77
7	6 55.9	158	11 59 23.05	59 24.11	2 43 29.7	43 15.5	7.1481	8.286	2.95	3.77
8	6 52.0	159	11 59 25.26	59 26.50	2 43 0.7	42 45.3	7.2200	8.322	2.95	3.77
9	6 48.1	160	11 59 27.83	59 29.26	2 42 29.3	42 12.7	7.2818	8.355	2.95	3.77
10	6 44.2	161	11 59 30.77	59 32.39	2 41 55.5	41 37.7	7.3365	8.386	2.95	3.76
11	6 40.3	162	11 59 34.08	59 35.88	2 41 19.3	41 0.3	7.3851	8.414	2.95	3.76
12	6 36.4	163	11 59 37.76	59 39.74	2 40 40.8	40 20.6	7.4282	8.440	2.94	3.76
13	6 32.6	164	11 59 41.80	59 43.96	2 39 59.9	39 38.5	7.4670	8.465	2.94	3.76
14	6 28.7	165	11 59 46.20	59 48.55	2 39 16.7	38 54.1	7.5030	8.489	2.94	3.75
15	6 24.9	166	11 59 50.97	59 53.50	2 38 31.1	38 7.3	7.5367	8.512	2.94	3.75
16	6 21.1	167	11 59 56.11	59 58.82	2 37 43.1	37 18.1	7.5680	8.534	2.94	3.75
17	6 17.2	168	12 0 1.62	0 4.51	2 36 52.7	36 26.6	7.5967	8.554	2.94	3.74
18	6 13.4	169	12 0 7.49	0 10.56	2 36 0.0	35 32.7	7.6234	8.573	2.94	3.74
19	6 9.6	170	12 0 13.72	0 16.97	2 35 5.0	34 36.5	7.6481	8.591	2.94	3.74
20	6 5.7	171	12 0 20.30	0 23.73	2 34 7.7	33 38.1	7.6716	8.608	2.94	3.73
21	6 1.9	172	12 0 27.24	0 30.84	2 33 8.1	32 37.4	7.6938	8.625	2.93	3.73
22	5 58.1	173	12 0 34.53	0 38.31	2 32 6.3	31 34.5	7.7147	8.640	2.93	3.72
23	5 54.3	174	12 0 42.17	0 46.13	2 31 2.3	30 29.4	7.7346	8.655	2.93	3.72
24	5 50.5	175	12 0 50.16	0 54.29	2 29 56.1	29 22.1	7.7533	8.670	2.92	3.72
25	5 46.7	176	12 0 58.49	1 2.80	2 28 47.7	28 12.6	7.7713	8.684	2.92	3.71
26	5 42.9	177	12 1 7.17	1 11.65	2 27 37.1	27 0.9	7.7888	8.697	2.92	3.71
27	5 39.1	178	12 1 16.20	1 20.85	2 26 24.3	25 47.0	7.8054	8.710	2.91	3.70
28	5 35.4	179	12 1 25.57	1 30.39	2 25 9.4	24 31.0	7.8210	8.722	2.91	3.70
29	5 31.6	180	12 1 35.27	1 40.26	2 23 52.4	23 12.9	7.8357	8.734	2.91	3.70
30	5 27.8	181	12 1 45.30	1 50.46	2 22 33.3	21 52.8	7.8502	8.746	2.90	3.69
31	5 24.1	182	12 1 55.67	2 1.00	+ 2 21 12.1	20 30.6	+7.8643	-8.757	+2.90	-3.69

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.			Apparent Declination.			Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t ² .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
July	d h m	d h m s	m s	+ 2 21 12.1	20 30.6	+7.8643	-8.757	+2.90	-3.69		
1	5 24.1	182 12 1 55.67	2 1.00	2 19 48.9	19 6.4	7.8777	8.767	2.90	3.68		
2	5 20.3	183 12 2 6.37	2 11.87	2 18 23.7	17 40.1	7.8907	8.777	2.89	3.68		
3	5 16.6	184 12 2 17.40	2 23.06	2 16 56.4	16 11.8	7.9031	8.788	2.89	3.67		
4	5 12.8	185 12 2 28.76	2 34.58	2 15 27.1	14 41.5	7.9148	8.797	2.89	3.67		
5	5 9.1	186 12 2 40.44	2 46.42	2 13 55.8	13 9.2	7.9260	8.807	2.88	3.67		
6	5 5.4	187 12 2 52.43	2 58.57	2 12 22.5	11 34.9	7.9372	8.816	2.88	3.66		
7	5 1.6	188 12 3 4.73	3 11.03	2 10 47.3	9 58.7	7.9482	8.825	2.87	3.66		
8	4 57.9	189 12 3 17.35	3 23.81	2 9 10.2	8 20.6	7.9587	8.833	2.87	3.66		
9	4 54.2	190 12 3 30.29	3 36.91	2 7 31.1	6 40.5	7.9687	8.842	2.87	3.65		
10	4 50.5	191 12 3 43.54	3 50.31	2 5 50.1	4 58.5	7.9784	8.850	2.86	3.65		
11	4 46.8	192 12 3 57.09	4 4.01	2 4 7.2	3 14.6	7.9879	8.858	2.86	3.64		
12	4 43.1	193 12 4 10.94	4 18.02	2 2 22.4	1 28.9	7.9973	8.866	2.86	3.64		
13	4 39.4	194 12 4 25.10	4 32.33	1 60 35.8	50 41.4	8.0063	8.873	2.85	3.63		
14	4 35.7	195 12 4 39.56	4 46.94	1 58 47.4	57 52.1	8.0151	8.880	2.85	3.63		
15	4 32.0	196 12 4 54.32	5 1.85	1 56 57.3	56 1.1	8.0236	8.887	2.85	3.62		
16	4 28.3	197 12 5 9.38	5 17.06	1 55 5.4	54 8.3	8.0317	8.894	2.84	3.62		
17	4 24.6	198 12 5 24.73	5 32.56	1 53 11.7	52 13.7	8.0396	8.901	2.84	3.61		
18	4 21.0	199 12 5 40.36	5 48.34	1 51 16.3	50 17.4	8.0474	8.907	2.83	3.60		
19	4 17.3	200 12 5 56.28	6 4.40	1 49 19.2	48 19.5	8.0548	8.913	2.83	3.60		
20	4 13.6	201 12 6 12.48	6 20.74	1 47 20.5	46 20.0	8.0619	8.919	2.82	3.59		
21	4 10.0	202 12 6 28.95	6 37.35	1 45 20.2	44 18.8	8.0690	8.925	2.82	3.59		
22	4 6.3	203 12 6 45.69	6 54.24	1 43 18.2	42 16.0	8.0760	8.931	2.81	3.58		
23	4 2.7	204 12 7 2.71	7 11.40	1 41 14.6	40 11.6	8.0827	8.936	2.81	3.58		
24	3 59.1	205 12 7 20.00	7 28.82	1 39 9.5	38 5.7	8.0890	8.941	2.80	3.57		
25	3 55.4	206 12 7 37.55	7 46.50	1 37 2.9	35 58.3	8.0951	8.947	2.80	3.56		
26	3 51.8	207 12 7 55.35	8 4.43	1 34 54.7	33 49.3	8.1012	8.952	2.79	3.55		
27	3 48.2	208 12 8 13.40	8 22.62	1 32 45.0	31 38.8	8.1073	8.957	2.78	3.54		
28	3 44.6	209 12 8 31.71	8 41.06	1 30 33.9	29 26.9	8.1130	8.962	2.78	3.54		
29	3 40.9	210 12 8 50.27	8 59.75	1 28 21.4	27 13.7	8.1186	8.966	2.77	3.53		
30	3 37.3	211 12 9 9.07	9 18.68	1 26 7.5	24 59.1	8.1240	8.971	2.77	3.52		
Aug	31 3 33.7	212 12 9 28.11	9 37.85	1 23 52.1	22 43.0	8.1293	8.975	2.76	3.51		
1	3 30.1	213 12 9 47.39	9 57.25	1 21 35.3	20 25.5	8.1346	8.980	2.75	3.50		
2	3 26.5	214 12 10 6.90	10 16.88	1 19 17.2	18 6.7	8.1397	8.984	2.75	3.50		
3	3 22.9	215 12 10 26.65	10 36.75	1 16 57.8	15 46.6	8.1447	8.988	2.74	3.49		
4	3 19.3	216 12 10 46.63	10 56.85	1 14 37.1	13 25.2	8.1496	8.992	2.74	3.48		
5	3 15.7	217 12 11 6.84	11 17.18	1 12 15.1	11 2.5	8.1542	8.996	2.73	3.47		
6	3 12.1	218 12 11 27.27	11 37.73	1 9 51.8	8 38.5	8.1589	9.000	2.72	3.46		
7	3 8.5	219 12 11 47.92	11 58.50	1 7 27.3	6 13.3	8.1633	9.003	2.72	3.46		
8	3 4.9	220 12 12 8.79	12 19.40	1 5 1.6	3 47.0	8.1677	9.007	2.71	3.45		
9	3 1.3	221 12 12 29.87	12 40.68	1 2 34.7	1 19.5	8.1720	9.010	2.70	3.44		
10	2 57.7	222 12 12 51.16	13 2.08	0 60 6.6	58 50.8	8.1762	9.014	2.69	3.43		
11	2 54.2	223 12 13 12.66	13 23.69	0 57 37.3	56 20.9	8.1803	9.017	2.68	3.42		
12	2 50.6	224 12 13 34.37	13 45.51	0 55 6.9	53 49.9	8.1842	9.020	2.68	3.41		
13	2 47.0	225 12 13 56.28	14 7.53	0 52 35.5	51 17.9	8.1879	9.023	2.67	3.40		
14	2 43.5	226 12 14 18.38	14 29.73	0 50 3.0	48 44.8	8.1916	9.026	2.66	3.39		
15	2 39.9	227 12 14 40.67	14 52.12	0 47 20.5	46 10.7	8.1953	9.029	2.65	3.38		
16	2 36.4	228 12 15 3.15	15 14.70	0 44 54.9	43 35.6	8.1988	9.032	2.64	3.36		
17	2 32.8	229 12 15 25.82	15 37.47	0 42 19.3	40 59.5	8.2021	9.035	2.63	3.35		
18	2 29.3	230 12 15 48.67	16 0.42	0 39 42.8	38 22.5	8.2053	9.037	2.62	3.34		
19	2 25.7	231 12 16 11.69	16 23.53	0 37 5.4	35 44.6	8.2085	9.040	2.61	3.32		
20	2 22.2	232 12 16 34.88	16 46.81	0 34 27.1	33 5.8	8.2117	9.042	2.60	3.31		
21	2 18.7	233 12 16 58.24	17 10.26	0 31 47.9	30 26.1	8.2147	9.045	2.59	3.29		
22	2 15.2	234 12 17 21.77	17 33.88	0 29 7.9	27 45.6	8.2177	9.047	2.58	3.28		
23	2 11.6	235 12 17 45.46	17 57.66	0 26 27.1	25 4.3	8.2205	9.049	2.57	3.27		
24	2 8.1	236 12 18 9.31	18 21.60	0 23 45.5	22 22.3	8.2231	9.051	2.56	3.25		
25	2 4.6	237 12 18 33.31	18 45.68	0 21 3.1	19 39.5	8.2257	9.053	2.55	3.24		
26	2 1.1	238 12 18 57.45	19 9.90	0 18 19.9	16 55.9	8.2283	9.055	2.54	3.22		
27	1 57.5	239 12 19 21.74	19 34.27	0 15 36.0	14 11.6	8.2308	9.057	2.53	3.21		
28	1 54.0	240 12 19 46.17	19 58.78	0 12 51.5	11 26.7	8.2333	9.059	2.52	3.20		
29	1 50.5	241 12 20 10.74	20 23.43	0 10 6.3	8 41.1	8.2357	9.061	2.51	3.18		
30	1 47.0	242 12 20 35.45	20 48.21	+ 0 7 20.4	5 54.8	+8.2379	-9.062	+2.50	-3.17		
31	1 43.5	243 12 21 0.29	21 13.12								

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.			Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t .		
				At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.	
Sept.	d	h m	d	h m s	m s	+ 0	4 33.9	3 7.9	+8.2402	-9.064	+2.49	-3.15
	2	1 36.4	245	12 21 25.26	21 38.17	+ 0	1 46.9	0 20.5	8.2424	9.065	2.48	3.14
	3	1 32.9	246	12 22 15.59	22 28.64	- 0	1 0.7	2 27.4	8.2446	9.067	2.47	3.13
	4	1 29.4	247	12 22 40.94	22 54.06	0	3 48.9	5 15.9	8.2466	9.068	2.45	3.11
	5	1 25.9	248	12 23 6.40	23 19.59	0	6 37.7	8 5.0	8.2484	9.070	2.44	3.10
	6	1 22.4	249	12 23 31.97	23 45.22	0	9 27.0	10 54.6	8.2503	9.071	2.42	3.08
	7	1 18.9	250	12 23 57.65	24 10.95	0	12 16.8	13 44.7	8.2522	9.072	2.41	3.06
	8	1 15.4	251	12 24 23.43	24 36.79	0	15 7.0	16 35.2	8.2538	9.073	2.39	3.04
	9	1 11.9	252	12 24 49.32	25 2.74	0	17 57.6	19 26.0	8.2556	9.074	2.38	3.02
	10	1 8.4	253	12 25 15.31	25 28.79	0	20 48.6	22 17.2	8.2572	9.075	2.36	3.00
	11	1 4.9	254	12 25 41.39	25 54.93	0	23 40.0	25 8.8	8.2587	9.076	2.34	2.98
	12	1 1.4	255	12 26 7.56	26 21.15	0	26 31.8	28 0.8	8.2601	9.077	2.32	2.95
	13	0 57.9	256	12 26 33.81	26 47.45	0	29 23.9	30 53.1	8.2614	9.078	2.30	2.91
	14	0 54.4	257	12 27 0.14	27 13.83	0	32 16.2	33 45.6	8.2627	9.078	2.28	2.86
	15	0 50.9	258	12 27 26.55	27 40.28	0	35 8.7	36 38.3	8.2640	9.079	2.26	2.81
	16	0 47.4	259	12 27 53.03	28 6.80	0	38 1.5	39 31.3	8.2651	9.079	2.23	2.75
	17	0 43.9	260	12 28 19.58	28 33.39	0	40 54.5	42 24.5	8.2662	9.080	2.20	-2.68
	18	0 40.4	261	12 28 46.19	29 0.04	0	43 47.7	45 17.8	8.2673	9.080	2.17	
	19	0 36.9	262	12 29 12.87	29 26.76	0	46 41.0	48 11.2	8.2683	9.081	2.14	
	20	0 33.4	263	12 29 39.61	29 53.54	0	49 34.5	51 4.8	8.2692	9.081	2.11	
	21	0 30.0	264	12 30 6.40	30 20.37	0	52 28.1	53 58.5	8.2699	9.081	2.08	
	22	0 26.5	265	12 30 33.23	30 47.24	0	55 21.7	56 52.2	8.2707	9.081	2.04	
	23	0 23.0	266	12 31 0.11	31 14.15	0	58 15.4	59 45.9	8.2715	9.081	2.00	
	24	0 19.5	267	12 31 27.04	31 41.11	1	1 9.0	2 39.6	8.2722	9.081	1.96	
	25	0 16.0	268	12 31 54.01	32 8.10	1	4 2.6	5 33.3	8.2728	9.081	1.92	
	26	0 12.6	269	12 32 21.01	32 35.12	1	6 56.2	8 26.9	8.2732	9.081	1.88	
	27	0 9.1	270	12 32 48.03	33 2.16	1	9 49.7	11 20.4	8.2735	9.081	1.83	
	28	0 5.6	271	12 33 15.07	33 29.23	1	12 43.1	14 13.8	8.2739	9.081	1.78	
	29	0 2.1	272	12 33 42.14	33 56.32	1	15 36.5	17 7.2	8.2744	9.081	1.73	
	29 23	58.6	273	12 34 9.24	34 23.44	1	18 29.8	20 0.5	8.2748	9.080	+1.68	+2.68
	30 23	55.2	274	12 34 36.36	34 50.58	1	21 22.9	22 53.6	8.2750	9.080		2.73
Oct.	1 23	51.7	275	12 35 3.49	35 17.72	1	24 15.8	25 46.5	8.2751	9.079		2.78
	2 23	48.2	276	12 35 30.62	35 44.86	1	27 8.5	28 39.1	8.2751	9.079		2.82
	3 23	44.7	277	12 35 57.75	36 12.00	1	30 0.9	31 31.4	8.2752	9.078		2.86
	4 23	41.2	278	12 36 24.89	36 39.15	1	32 53.0	34 23.4	8.2752	9.077		2.89
	5 23	37.7	279	12 36 52.03	37 6.29	1	35 44.9	37 15.2	8.2752	9.077		2.92
	6 23	34.3	280	12 37 19.16	37 33.42	1	38 36.5	40 6.7	8.2750	9.076		2.95
	7 23	30.8	281	12 37 46.28	38 0.54	1	41 27.7	42 57.8	8.2748	9.075		2.98
	8 23	27.3	282	12 38 13.39	38 27.65	1	44 18.6	45 48.5	8.2746	9.074	-1.68	3.01
	9 23	23.8	283	12 38 40.48	38 54.73	1	47 9.1	48 38.8	8.2742	9.073	1.79	3.04
	10 23	20.3	284	12 39 7.54	39 21.79	1	49 59.2	51 28.7	8.2738	9.072	1.86	3.07
	11 23	16.9	285	12 39 34.58	39 48.82	1	52 48.8	54 18.1	8.2734	9.070	1.92	3.09
	12 23	13.4	286	12 40 1.50	40 15.82	1	55 37.9	57 7.0	8.2728	9.069	1.97	3.11
	13 23	9.9	287	12 40 28.56	40 42.78	1	58 26.5	59 55.4	8.2722	9.068	2.01	3.13
	14 23	6.4	288	12 40 55.49	41 9.70	2	1 14.6	2 43.3	8.2715	9.067	2.05	3.15
	15 23	2.9	289	12 41 22.37	41 36.57	2	4 2.2	5 30.6	8.2707	9.065	2.08	3.16
	16 22	59.5	290	12 41 49.20	42 3.38	2	6 49.1	8 17.2	8.2699	9.063	2.11	3.18
	17 22	56.0	291	12 42 15.98	42 30.13	2	9 35.4	11 3.2	8.2690	9.062	2.14	3.19
	18 22	52.5	292	12 42 42.70	42 56.82	2	12 21.0	13 48.5	8.2679	9.060	2.17	3.21
	19 22	49.0	293	12 43 9.35	43 23.45	2	15 5.9	16 33.1	8.2668	9.058	2.20	3.22
	20 22	45.5	294	12 43 35.93	43 50.01	2	17 50.1	19 17.0	8.2656	9.056	2.23	3.23
	21 22	42.0	295	12 44 2.44	44 16.49	2	20 33.6	22 0.1	8.2645	9.054	2.26	3.25
	22 22	38.5	296	12 44 28.88	44 42.89	2	23 16.4	24 42.5	8.2632	9.052	2.28	3.26
	23 22	35.0	297	12 44 55.24	45 9.21	2	25 58.4	27 24.2	8.2619	9.050	2.30	3.28
	24 22	31.5	298	12 45 21.52	45 35.45	2	28 39.7	30 5.1	8.2605	9.048	2.32	3.29
	25 22	28.0	299	12 45 47.71	46 1.60	2	31 20.1	32 45.1	8.2591	9.046	2.34	3.30
	26 22	24.5	300	12 46 13.82	46 27.67	2	33 59.6	35 24.2	8.2577	9.043	2.36	3.32
	27 22	21.0	301	12 46 39.84	46 53.65	2	36 38.2	38 2.4	8.2561	9.041	2.37	3.33
	28 22	17.5	302	12 47 5.76	47 19.52	2	39 15.9	40 39.7	8.2544	9.038	2.39	3.34
	29 22	14.0	303	12 47 31.57	47 45.28	2	41 52.8	43 16.0	8.2525	9.036	2.41	3.35
	30 22	10.5	304	12 47 57.27	48 10.93	2	44 28.7	45 51.4	8.2507	9.033	2.42	3.36
	31 22	7.0	305	12 48 22.87	48 36.47	- 2	47 3.7	48 25.9	+8.2489	-9.031	-2.44	+3.38

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Nov. 1 22 3.5	306	12 48 48.35	49 1.90	2 49 37.7	50 59.4	+8.2468	-9.028	-2.45	+3.30
2 22 0.0	307	12 49 13.71	49 27.21	2 52 10.6	53 31.8	8.2448	9.024	2.47	3.40
3 21 56.5	308	12 49 38.95	49 52.39	2 54 42.4	56 3.1	8.2427	9.021	2.49	3.41
4 21 52.9	309	12 50 4.07	50 17.44	2 57 13.1	58 33.3	8.2405	9.018	2.50	3.42
5 21 49.4	310	12 50 29.06	50 42.36	2 59 42.8	61 2.4	8.2382	9.015	2.51	3.43
6 21 45.9	311	12 50 53.91	51 7.14	3 2 11.3	3 30.3	8.2357	9.012	2.53	3.44
7 21 42.4	312	12 51 18.62	51 31.78	3 4 38.6	5 57.0	8.2332	9.008	2.54	3.45
8 21 38.9	313	12 51 43.18	51 56.27	3 7 4.7	8 22.5	8.2305	9.005	2.56	3.46
9 21 35.3	314	12 52 7.59	52 20.60	3 9 29.6	10 46.8	8.2279	9.001	2.57	3.47
10 21 31.8	315	12 52 31.85	52 44.78	3 11 53.2	13 9.8	8.2251	8.997	2.59	3.48
11 21 28.3	316	12 52 55.95	53 8.80	3 14 15.6	15 31.5	8.2221	8.993	2.60	3.49
12 21 24.7	317	12 53 19.88	53 32.65	3 16 36.7	17 51.9	8.2190	8.989	2.61	3.50
13 21 21.2	318	12 53 43.64	53 56.33	3 18 56.4	20 10.9	8.2159	8.985	2.63	3.51
14 21 17.6	319	12 54 7.23	54 19.83	3 21 14.8	22 28.6	8.2128	8.981	2.64	3.52
15 21 14.1	320	12 54 30.65	54 43.16	3 23 31.8	24 44.9	8.2095	8.976	2.65	3.53
16 21 10.6	321	12 54 53.88	55 6.30	3 25 47.4	26 59.8	8.2059	8.972	2.66	3.54
17 21 7.0	322	12 55 16.92	55 29.25	3 28 1.6	29 13.3	8.2023	8.967	2.67	3.55
18 21 3.5	323	12 55 39.77	55 52.00	3 30 14.3	31 25.2	8.1986	8.962	2.68	3.56
19 20 59.9	324	12 56 2.42	56 14.55	3 32 25.5	33 35.6	8.1949	8.957	2.69	3.56
20 20 56.4	325	12 56 24.88	56 36.91	3 34 35.2	35 44.5	8.1911	8.952	2.70	3.57
21 20 52.8	326	12 56 47.14	56 59.07	3 36 43.4	37 51.9	8.1871	8.947	2.71	3.57
22 20 49.2	327	12 57 9.19	57 21.02	3 38 50.0	39 57.7	8.1830	8.941	2.72	3.58
23 20 45.7	328	12 57 31.03	57 42.75	3 40 55.1	42 2.0	8.1788	8.936	2.73	3.58
24 20 42.1	329	12 57 52.66	58 4.26	3 42 58.6	44 4.7	8.1745	8.930	2.73	3.59
25 20 38.5	330	12 58 14.07	58 25.55	3 45 0.5	46 5.7	8.1700	8.925	2.74	3.60
26 20 34.9	331	12 58 35.26	58 46.62	3 47 0.7	48 5.1	8.1654	8.919	2.74	3.60
27 20 31.3	332	12 58 56.22	59 7.46	3 48 59.3	50 2.8	8.1606	8.913	2.75	3.61
28 20 27.7	333	12 59 16.95	59 28.07	3 50 56.2	51 58.8	8.1558	8.906	2.75	3.61
29 20 24.1	334	12 59 37.45	59 48.44	3 52 51.4	53 53.1	8.1508	8.900	2.76	3.62
30 20 20.5	335	12 59 57.71	60 8.57	3 54 44.9	55 45.7	8.1457	8.893	2.77	3.63
Dec. 1 20 16.9	336	13 0 17.73	0 28.46	3 56 36.7	57 36.6	8.1404	8.887	2.78	3.63
2 20 13.3	337	13 0 37.50	0 48.10	3 58 26.7	59 25.6	8.1349	8.879	2.79	3.64
3 20 9.7	338	13 0 57.02	1 7.49	4 0 14.9	1 12.8	8.1292	8.872	2.80	3.64
4 20 6.1	339	13 1 16.28	1 26.61	4 2 1.2	2 58.1	8.1234	8.864	2.80	3.65
5 20 2.4	340	13 1 35.28	1 45.47	4 3 45.7	4 41.6	8.1174	8.857	2.81	3.65
6 19 58.8	341	13 1 54.02	2 4.07	4 5 28.3	6 23.2	8.1113	8.849	2.81	3.66
7 19 55.2	342	13 2 12.49	2 22.40	4 7 9.0	8 2.9	8.1049	8.841	2.82	3.66
8 19 51.6	343	13 2 30.69	2 40.45	4 8 47.8	9 40.6	8.0984	8.832	2.82	3.66
9 19 48.0	344	13 2 48.61	2 58.22	4 10 24.6	11 16.4	8.0914	8.823	2.83	3.67
10 19 44.3	345	13 3 6.24	3 15.70	4 11 59.4	12 50.2	8.0843	8.814	2.84	3.67
11 19 40.7	346	13 3 23.58	3 32.89	4 13 32.3	14 22.0	8.0772	8.805	2.84	3.68
12 19 37.0	347	13 3 40.64	3 49.79	4 15 3.2	15 51.8	8.0698	8.795	2.85	3.68
13 19 33.3	348	13 3 57.40	4 6.39	4 16 32.0	17 19.5	8.0619	8.785	2.85	3.68
14 19 29.7	349	13 4 13.85	4 22.68	4 17 58.8	18 45.2	8.0537	8.775	2.86	3.69
15 19 26.0	350	13 4 29.99	4 38.66	4 19 23.6	20 8.9	8.0455	8.765	2.86	3.69
16 19 22.3	351	13 4 45.83	4 54.33	4 20 46.3	21 30.5	8.0371	8.753	2.87	3.70
17 19 18.7	352	13 5 1.36	5 9.69	4 22 6.8	22 49.9	8.0285	8.742	2.88	3.70
18 19 15.0	353	13 5 16.58	5 24.74	4 23 25.2	24 7.2	8.0196	8.730	2.88	3.70
19 19 11.3	354	13 5 31.49	5 39.48	4 24 41.5	25 22.3	8.0104	8.718	2.89	3.71
20 19 7.6	355	13 5 46.08	5 53.90	4 25 55.6	26 35.3	8.0007	8.705	2.89	3.71
21 19 3.9	356	13 6 0.34	6 7.99	4 27 7.6	27 46.1	7.9907	8.692	2.90	3.72
22 19 0.2	357	13 6 14.27	6 21.74	4 28 17.4	28 54.7	7.9804	8.679	2.90	3.72
23 18 56.5	358	13 6 27.87	6 35.16	4 29 25.0	30 1.1	7.9699	8.665	2.91	3.72
24 18 52.8	359	13 6 41.14	6 48.25	4 30 30.5	31 5.4	7.9591	8.651	2.91	3.73
25 18 49.1	360	13 6 54.08	7 1.01	4 31 33.8	32 7.5	7.9478	8.635	2.91	3.73
26 18 45.4	361	13 7 6.68	7 13.43	4 32 34.8	33 7.3	7.9361	8.619	2.92	3.73
27 18 41.6	362	13 7 18.94	7 25.50	4 33 33.5	34 4.8	7.9239	8.602	2.92	3.74
28 18 37.9	363	13 7 30.85	7 37.22	4 34 30.0	35 0.0	7.9111	8.585	2.92	3.74
29 18 34.2	364	13 7 42.41	7 48.59	4 35 24.2	35 53.0	7.8978	8.566	2.93	3.74
30 18 30.4	365	13 7 53.61	7 59.60	4 36 16.1	36 43.7	7.8838	8.547	2.93	3.75
31 18 26.7	366	13 8 4.45	8 10.25	4 37 5.7	37 32.0	7.8696	8.527	2.94	3.75
32 18 22.9	367	13 8 14.94	8 20.54	4 37 53.0	38 17.9	+7.8549	-8.505	-2.94	+3.75

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Jan. 0 10 25.6	0	5 6 52.09	6 49.96	+22 58 32.9	58 30.3	-7.8379	-7.933	+2.37	+2.42
1 10 21.5	1	5 6 42.18	6 40.08	22 58 20.5	58 18.0	7.8330	7.930	2.38	2.45
2 10 17.5	2	5 6 32.40	6 30.32	22 58 8.4	58 6.0	7.8288	7.926	2.40	2.47
3 10 13.4	3	5 6 22.74	6 20.69	22 57 56.5	57 54.1	7.8244	7.922	2.42	2.49
4 10 9.2	4	5 6 13.18	6 11.16	22 57 44.6	57 42.2	7.8197	7.917	2.44	2.51
5 10 5.1	5	5 6 3.72	6 1.72	22 57 32.7	57 30.3	7.8149	7.912	2.46	2.52
6 10 1.1	6	5 5 54.37	5 52.40	22 57 21.0	57 18.7	7.8095	7.907	2.48	2.53
7 9 57.0	7	5 5 45.16	5 43.22	22 57 9.4	57 7.1	7.8037	7.901	2.49	2.54
8 9 52.9	8	5 5 36.09	5 34.18	22 56 58.1	56 55.7	7.7976	7.894	2.51	2.56
9 9 48.8	9	5 5 27.14	5 25.26	22 56 47.0	56 44.7	7.7912	7.887	2.53	2.57
10 9 44.7	10	5 5 18.32	5 16.46	22 56 36.0	56 33.8	7.7846	7.879	2.54	2.58
11 9 40.6	11	5 5 9.65	5 7.82	22 56 25.2	56 23.0	7.7775	7.872	2.56	2.59
12 9 36.6	12	5 5 1.12	4 59.32	22 56 14.5	56 12.4	7.7700	7.865	2.57	2.60
13 9 32.5	13	5 4 52.75	4 50.98	22 56 4.0	56 1.9	7.7621	7.858	2.59	2.61
14 9 28.4	14	5 4 44.52	4 42.79	22 55 53.6	55 51.5	7.7538	7.851	2.60	2.63
15 9 24.3	15	5 4 36.44	4 34.75	22 55 43.4	55 41.4	7.7452	7.846	2.61	2.64
16 9 20.2	16	5 4 28.51	4 26.85	22 55 33.4	55 31.4	7.7361	7.839	2.62	2.65
17 9 16.2	17	5 4 20.76	4 19.14	22 55 23.6	55 21.6	7.7266	7.831	2.63	2.66
18 9 12.1	18	5 4 13.18	4 11.59	22 55 14.0	55 12.0	7.7167	7.823	2.64	2.67
19 9 8.1	19	5 4 5.76	4 4.21	22 55 4.5	55 2.6	7.7064	7.815	2.65	2.69
20 9 4.1	20	5 3 58.52	3 57.01	22 54 55.2	54 53.3	7.6959	7.806	2.66	2.70
21 9 0.0	21	5 3 51.47	3 50.00	22 54 46.1	54 44.3	7.6850	7.797	2.66	2.71
22 8 56.0	22	5 3 44.61	3 43.18	22 54 37.3	54 35.5	7.6735	7.787	2.67	2.72
23 8 52.0	23	5 3 37.93	3 36.54	22 54 28.7	54 27.0	7.6614	7.776	2.67	2.73
24 8 47.9	24	5 3 31.43	3 30.08	22 54 20.4	54 18.7	7.6487	7.764	2.68	2.74
25 8 43.9	25	5 3 25.12	3 23.81	22 54 12.3	54 10.7	7.6354	7.751	2.68	2.75
26 8 39.9	26	5 3 19.00	3 17.73	22 54 4.5	54 2.9	7.6216	7.739	2.68	2.76
27 8 35.8	27	5 3 13.07	3 11.84	22 53 56.8	53 55.3	7.6072	7.726	2.69	2.77
28 8 31.8	28	5 3 7.33	3 6.14	22 53 49.4	53 47.9	7.5922	7.712	2.69	2.78
29 8 27.8	29	5 3 1.78	3 0.63	22 53 42.2	53 40.7	7.5763	7.697	2.69	2.79
30 8 23.7	30	5 2 56.44	2 55.34	22 53 35.2	53 33.8	7.5601	7.681	2.70	2.80
31 8 19.7	31	5 2 51.31	2 50.25	22 53 28.5	53 27.1	7.5431	7.663	2.70	2.81
Feb. 1 8 15.7	32	5 2 46.39	2 45.38	22 53 22.1	53 20.8	7.5252	7.644	2.70	2.82
2 8 11.7	33	5 2 41.68	2 40.71	22 53 16.1	53 14.9	7.5062	7.623	2.70	2.83
3 8 7.7	34	5 2 37.18	2 36.26	22 53 10.4	53 9.3	7.4858	7.600	2.71	2.84
4 8 3.6	35	5 2 32.88	2 32.01	22 53 5.0	53 3.9	7.4638	7.574	2.71	2.84
5 7 59.6	36	5 2 28.79	2 27.96	22 52 59.7	52 58.7	7.4408	7.549	2.71	2.85
6 7 55.6	37	5 2 24.90	2 24.12	22 52 54.6	52 53.6	7.4167	7.524	2.71	2.85
7 7 51.6	38	5 2 21.23	2 20.50	22 52 49.8	52 48.9	7.3909	7.498	2.71	2.85
8 7 47.6	39	5 2 17.77	2 17.09	22 52 45.3	52 44.5	7.3639	7.471	2.72	2.86
9 7 43.7	40	5 2 14.54	2 13.90	22 52 41.2	52 40.5	7.3330	7.444	2.72	2.86
10 7 39.7	41	5 2 11.55	2 10.95	22 52 37.4	52 36.8	7.3010	7.414	2.72	2.86
11 7 35.7	42	5 2 8.77	2 8.22	22 52 33.9	52 33.4	7.2667	7.379	2.72	2.86
12 7 31.7	43	5 2 6.22	2 5.72	22 52 30.7	52 30.2	7.2297	7.339	2.72	2.86
13 7 27.8	44	5 2 3.88	2 3.43	22 52 27.8	52 27.4	7.1897	7.292	2.72	2.87
14 7 23.9	45	5 2 1.75	2 1.34	22 52 25.2	52 24.9	7.1448	7.240	2.72	2.87
15 7 19.9	46	5 1 59.85	1 59.49	22 52 22.9	52 22.7	7.0948	7.180	2.72	2.87
16 7 16.0	47	5 1 58.18	1 57.87	22 52 20.9	52 20.7	7.0348	7.110	2.73	2.87
17 7 12.0	48	5 1 56.75	1 56.48	22 52 19.2	52 19.1	6.9608	7.020	2.73	2.87
18 7 8.1	49	5 1 55.56	1 55.34	22 52 17.9	52 17.8	6.8733	6.905	2.73	2.87
19 7 4.1	50	5 1 54.59	1 54.42	22 52 16.9	52 16.8	6.7710	6.762	2.73	2.88
20 7 0.2	51	5 1 53.85	1 53.72	22 52 16.2	52 16.2	6.6409	6.579	2.73	2.88
21 6 56.2	52	5 1 53.33	1 53.25	22 52 15.8	52 15.8	6.4544	-6.212	2.73	2.88
22 6 52.3	53	5 1 53.04	1 53.01	22 52 15.7	52 15.7	-6.0177	+5.842	2.73	2.88
23 6 48.3	54	5 1 53.00	1 53.02	22 52 16.0	52 16.1	+5.6867	6.492	2.73	2.88
24 6 44.4	55	5 1 53.18	1 53.24	22 52 16.6	52 16.7	6.3040	6.712	2.73	2.88
25 6 40.5	56	5 1 53.58	1 53.68	22 52 17.5	52 17.7	6.5380	6.865	2.73	2.88
26 6 36.6	57	5 1 54.21	1 54.36	22 52 18.7	52 18.9	6.7080	6.984	2.73	2.88
27 6 32.6	58	5 1 55.07	1 55.27	22 52 20.2	52 20.5	6.8380	7.074	2.73	2.88
28 6 28.7	59	5 1 56.16	1 56.41	22 52 22.1	52 22.5	6.9330	7.144	2.73	2.88
29 6 24.8	60	5 1 57.49	1 57.79	22 52 24.2	52 24.7	7.0030	7.204	2.73	2.88
30 6 20.9	61	5 1 59.06	1 59.40	+22 52 26.7	52 27.2	+7.0614	+7.258	+2.73	+2.88

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar.	d h m	d h m s	m s	° ' "	° ' "				
1	6 24.8	60 5 1 57.49	1 57.79	+22 52 24.2	52 24.7	+7.0030	+7.204	+2.73	+2.88
2	6 20.9	61 5 1 59.06	1 59.40	22 52 26.7	52 27.2	7.0614	7.258	2.73	2.88
3	6 17.0	62 5 2 0.85	2 1.24	22 52 29.5	52 30.1	7.1149	7.307	2.73	2.87
4	6 13.1	63 5 2 2.87	2 3.30	22 52 32.5	52 33.2	7.1644	7.352	2.73	2.87
5	6 9.2	64 5 2 5.12	2 5.60	22 52 35.8	52 36.6	7.2103	7.393	2.73	2.87
6	6 5.3	65 5 2 7.59	2 8.12	22 52 39.5	52 40.3	7.2522	7.430	2.73	2.87
7	6 1.4	66 5 2 10.29	2 10.86	22 52 43.6	52 44.5	7.2901	7.461	2.73	2.87
8	5 57.5	67 5 2 13.21	2 13.83	22 52 47.9	52 48.9	7.3239	7.488	2.73	2.86
9	5 53.7	68 5 2 16.36	2 17.03	22 52 52.6	52 53.6	7.3554	7.514	2.73	2.86
10	5 49.8	69 5 2 19.74	2 20.46	22 52 57.6	52 58.6	7.3851	7.539	2.73	2.86
11	5 45.9	70 5 2 23.35	2 24.12	22 53 2.8	53 3.9	7.4131	7.565	2.73	2.86
12	5 42.1	71 5 2 27.19	2 28.00	22 53 8.5	53 9.5	7.4377	7.589	2.72	2.85
13	5 38.2	72 5 2 31.25	2 32.11	22 53 14.2	53 15.4	7.4605	7.612	2.72	2.85
14	5 34.3	73 5 2 35.53	2 36.44	22 53 20.4	53 21.6	7.4823	7.634	2.72	2.85
15	5 30.4	74 5 2 40.02	2 40.98	22 53 26.7	53 28.0	7.5033	7.655	2.72	2.84
16	5 26.6	75 5 2 44.72	2 45.72	22 53 33.4	53 34.8	7.5237	7.677	2.72	2.84
17	5 22.7	76 5 2 49.65	2 50.69	22 53 40.4	53 41.8	7.5431	7.697	2.72	2.83
18	5 18.9	77 5 2 54.81	2 55.88	22 53 47.8	53 49.2	7.5616	7.715	2.71	2.83
19	5 15.1	78 5 3 0.16	3 1.29	22 53 55.4	53 56.9	7.5792	7.732	2.71	2.82
20	5 11.2	79 5 3 5.73	3 6.91	22 54 3.5	54 5.1	7.5961	7.748	2.71	2.81
21	5 7.4	80 5 3 11.52	3 12.75	22 54 11.7	54 13.4	7.6121	7.764	2.71	2.80
22	5 3.5	81 5 3 17.52	3 18.79	22 54 20.2	54 21.9	7.6272	7.776	2.70	2.79
23	4 59.7	82 5 3 23.73	3 25.05	22 54 28.8	54 30.6	7.6417	7.787	2.70	2.78
24	4 55.9	83 5 3 30.16	3 31.52	22 54 37.7	54 39.5	7.6557	7.798	2.70	2.77
25	4 52.1	84 5 3 36.80	3 38.21	22 54 46.8	54 48.7	7.6692	7.809	2.70	2.76
26	4 48.3	85 5 3 43.63	3 45.08	22 54 56.1	54 58.1	7.6823	7.820	2.69	2.75
27	4 44.5	86 5 3 50.67	3 52.17	22 55 5.8	55 7.7	7.6949	7.831	2.69	2.74
28	4 40.7	87 5 3 57.90	3 59.44	22 55 15.8	55 17.8	7.7070	7.841	2.69	2.73
29	4 36.9	88 5 4 5.33	4 6.91	22 55 26.1	55 28.2	7.7187	7.851	2.69	2.72
30	4 33.1	89 5 4 12.96	4 14.59	22 55 36.5	55 38.6	7.7300	7.861	2.68	2.71
Apr.	d h m	d h m s	m s	° ' "	° ' "				
1	4 29.3	90 5 4 20.80	4 22.47	22 55 47.2	55 49.4	7.7409	7.871	2.68	2.70
2	4 25.5	91 5 4 28.83	4 30.55	22 55 58.0	56 0.3	7.7509	7.881	2.68	2.69
3	4 21.7	92 5 4 37.05	4 38.81	22 56 9.0	56 11.4	7.7607	7.891	2.67	2.69
4	4 17.9	93 5 4 45.46	4 47.26	22 56 20.3	56 22.8	7.7703	7.901	2.66	2.68
5	4 14.1	94 5 4 54.05	4 55.89	22 56 32.1	56 34.5	7.7797	7.910	2.65	2.67
6	4 10.3	95 5 5 2.83	5 4.71	22 56 44.0	56 46.5	7.7889	7.918	2.65	2.66
7	4 6.5	96 5 5 11.80	5 13.72	22 56 56.0	56 58.6	7.7979	7.926	2.64	2.65
8	4 2.7	97 5 5 20.95	5 22.91	22 57 8.3	57 10.9	7.8066	7.934	2.63	2.64
9	3 58.9	98 5 5 30.28	5 32.28	22 57 20.8	57 23.4	7.8150	7.942	2.62	2.63
10	3 55.1	99 5 5 39.78	5 41.82	22 57 33.5	57 36.2	7.8231	7.949	2.61	2.62
11	3 51.3	100 5 5 49.45	5 51.53	22 57 46.5	57 49.3	7.8310	7.956	2.60	2.61
12	3 47.5	101 5 5 59.30	6 1.42	22 57 59.7	58 2.5	7.8386	7.962	2.59	2.60
13	3 43.7	102 5 6 9.32	6 11.48	22 58 12.9	58 15.7	7.8459	7.968	2.58	2.60
14	3 40.0	103 5 6 19.51	6 21.71	22 58 26.2	58 29.0	7.8530	7.973	2.57	2.59
15	3 36.2	104 5 6 29.87	6 32.10	22 58 39.6	58 42.4	7.8599	7.978	2.56	2.58
16	3 32.4	105 5 6 40.40	6 42.66	22 58 53.2	58 56.1	7.8667	7.983	2.55	2.57
17	3 28.7	106 5 6 51.08	6 53.38	22 59 7.0	59 9.9	7.8734	7.987	2.55	2.56
18	3 24.9	107 5 7 1.91	7 4.24	22 59 21.0	59 33.9	7.8799	7.991	2.54	2.55
19	3 21.2	108 5 7 12.89	7 15.26	22 59 35.2	59 38.1	7.8862	7.995	2.53	2.54
20	3 17.4	109 5 7 24.04	7 26.44	22 59 49.6	59 52.5	7.8923	7.999	2.52	2.53
21	3 13.7	110 5 7 35.36	7 37.79	23 0 4.1	0 7.1	7.8981	8.003	2.51	2.52
22	3 9.9	111 5 7 46.82	7 49.29	23 0 18.7	0 21.7	7.9037	8.007	2.50	2.51
23	3 6.2	112 5 7 58.42	8 0.92	23 0 33.4	0 36.4	7.9091	8.011	2.50	2.50
24	3 2.5	113 5 8 10.16	8 12.69	23 0 48.3	0 51.3	7.9143	8.015	2.49	2.49
25	2 58.7	114 5 8 22.03	8 24.59	23 1 3.3	1 6.3	7.9193	8.019	2.49	2.48
26	2 55.0	115 5 8 34.06	8 36.65	23 1 18.4	1 21.5	7.9243	8.023	2.48	2.46
27	2 51.3	116 5 8 46.22	8 48.84	23 1 33.6	1 36.7	7.9291	8.026	2.48	2.45
28	2 47.6	117 5 8 58.51	9 1.16	23 1 49.0	1 52.0	7.9338	8.029	2.47	2.43
29	2 43.9	118 5 9 10.93	9 13.61	23 2 4.4	2 7.5	7.9384	8.032	2.46	2.42
30	2 40.2	119 5 9 23.48	9 26.19	23 2 20.1	2 23.1	7.9429	8.035	2.45	2.40
31	2 36.5	120 5 9 36.16	9 38.89	23 2 35.7	2 38.8	7.9471	8.038	2.44	2.38
32	2 32.8	121 5 9 48.97	9 51.73	+23 2 51.5	2 54.7	+7.9511	+8.040	+2.43	+2.36

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
May	d h m	d h m s	m s	° ' "	° ' "				
	1 2 32.8	121 5 9 48.97	9 51.73	+23 2 51.5	2 54.7	+7.9511	+8.040	+2.43	+2.36
	2 2 29.1	122 5 10 1.89	10 4.68	23 3 7.3	3 10.5	7.9550	8.042	2.42	2.34
	3 2 25.4	123 5 10 14.93	10 17.75	23 3 23.2	3 26.4	7.9588	8.044	2.41	2.32
	4 2 21.7	124 5 10 28.09	10 30.93	23 3 39.1	3 42.3	7.9625	8.046	2.40	2.30
	5 2 18.0	125 5 10 41.36	10 44.22	23 3 55.0	3 58.3	7.9662	8.048	2.39	2.28
	6 2 14.3	126 5 10 54.74	10 57.63	23 4 11.0	4 14.3	7.9697	8.050	2.38	2.25
	7 2 10.6	127 5 11 8.22	11 11.13	23 4 27.2	4 30.5	7.9731	8.052	2.37	2.23
	8 2 6.9	128 5 11 21.80	11 24.73	23 4 43.4	4 46.7	7.9764	8.053	2.36	2.20
	9 2 3.2	129 5 11 35.49	11 38.45	23 4 59.8	5 3.1	7.9796	8.054	2.35	2.17
	10 1 59.5	130 5 11 49.28	11 52.26	23 5 16.1	5 19.5	7.9827	8.055	2.33	2.14
	11 1 55.8	131 5 12 3.17	12 6.17	23 5 32.5	5 35.9	7.9856	8.055	2.32	2.11
	12 1 52.1	132 5 12 17.15	12 20.18	23 5 48.8	5 52.2	7.9884	8.056	2.30	+2.08
	13 1 48.4	133 5 12 31.22	12 34.27	23 6 5.2	6 8.6	7.9911	8.056	2.28	
	14 1 44.7	134 5 12 45.37	12 48.44	23 6 21.4	6 24.9	7.9937	8.057	2.26	
	15 1 41.0	135 5 12 59.61	13 2.70	23 6 37.8	6 41.2	7.9964	8.057	2.24	
	16 1 37.3	136 5 13 13.92	13 17.03	23 6 54.2	6 57.6	7.9989	8.057	2.22	
	17 1 33.6	137 5 13 28.32	13 31.45	23 7 10.7	7 14.1	8.0013	8.058	2.20	
	18 1 29.9	138 5 13 42.79	13 45.94	23 7 27.1	7 30.5	8.0036	8.058	2.18	
	19 1 26.2	139 5 13 57.35	14 0.52	23 7 43.5	7 46.9	8.0057	8.058	2.15	
	20 1 22.5	140 5 14 11.98	14 15.17	23 7 59.9	8 3.3	8.0077	8.058	2.19	
	21 1 18.8	141 5 14 26.67	14 29.88	23 8 16.4	8 19.8	8.0097	8.057	+2.08	
	22 1 15.1	142 5 14 41.42	14 44.64	23 8 32.8	8 36.2	8.0116	8.057		
	23 1 11.5	143 5 14 56.23	14 59.46	23 8 49.2	8 52.6	8.0134	8.056		
	24 1 7.8	144 5 15 11.09	15 14.34	23 9 5.6	9 9.0	8.0151	8.056		
	25- 1 4.1	145 5 15 26.01	15 29.28	23 9 21.9	9 25.3	8.0165	8.055		
	26 1 0.4	146 5 15 40.98	15 44.27	23 9 38.2	9 41.6	8.0180	8.055		
	27 0 56.7	147 5 15 56.01	15 59.31	23 9 54.4	9 57.8	8.0194	8.054		
	28 0 53.1	148 5 16 11.08	16 14.39	23 10 10.6	10 14.0	8.0207	8.053		
	29 0 49.4	149 5 16 26.21	16 29.54	23 10 26.9	10 30.2	8.0219	8.052		
	30 0 45.7	150 5 16 41.39	16 44.73	23 10 43.0	10 46.4	8.0231	8.051		
June	31 0 42.0	151 5 16 56.60	16 59.95	23 10 59.2	11 2.6	8.0241	8.050		
	1 0 38.3	152 5 17 11.84	17 15.20	23 11 15.3	11 18.7	8.0250	8.049	-2.06	
	2 0 34.6	153 5 17 27.11	17 30.48	23 11 31.3	11 34.7	8.0258	8.048	2.10	
	3 0 30.9	154 5 17 42.41	17 45.79	23 11 47.3	11 50.7	8.0265	8.046	2.13	
	4 0 27.3	155 5 17 57.73	18 1.12	23 12 3.3	12 6.6	8.0273	8.044	2.16	
	5 0 23.6	156 5 18 13.08	18 16.48	23 12 19.2	12 22.5	8.0280	8.042	2.19	
	6 0 19.9	157 5 18 28.45	18 31.85	23 12 35.0	12 38.3	8.0286	8.040	2.22	
	7 0 16.3	158 5 18 43.84	18 47.25	23 12 50.7	12 54.0	8.0291	8.037	2.25	
	8 0 12.6	159 5 18 59.24	19 2.65	23 13 6.4	13 9.7	8.0295	8.034	2.28	
	9 0 8.9	160 5 19 14.65	19 18.07	23 13 21.9	13 25.2	8.0297	8.032	2.30	
	10- 0 5.2	161 5 19 30.08	19 33.50	23 13 37.4	13 40.7	8.0298	8.030	2.32	
	11 0 1.6	162 5 19 45.52	19 48.94	23 13 52.8	13 56.1	8.0299	8.028	2.33	
	12 23 57.9	163 5 20 0.97	20 4.39	23 14 8.1	14 11.4	8.0300	8.026	2.34	
	13 23 54.2	164 5 20 16.43	20 19.86	23 14 23.4	14 26.7	8.0301	8.024	2.35	
	14 23 50.5	165 5 20 31.88	20 35.31	23 14 38.5	14 41.8	8.0301	8.021	2.35	
	15 23 46.9	166 5 20 47.32	20 50.75	23 14 53.5	14 56.8	8.0300	8.019	2.36	
	16 23 43.2	167 5 21 2.75	21 6.18	23 15 8.4	15 11.7	8.0298	8.016	2.37	
	17 23 39.5	168 5 21 18.17	21 21.60	23 15 23.2	15 26.5	8.0295	8.013	2.38	
	18 23 35.8	169 5 21 33.57	21 37.00	23 15 37.9	15 41.2	8.0292	8.010	2.39	
	19 23 32.1	170 5 21 48.97	21 52.40	23 15 52.6	15 55.8	8.0288	8.008	2.39	
	20 23 28.5	171 5 22 4.35	22 7.78	23 16 7.2	16 10.4	8.0282	8.005	2.40	
	21 23 24.8	172 5 22 19.70	22 23.13	23 16 21.7	16 24.9	8.0275	8.002	2.41	
	22 23 21.1	173 5 22 35.03	22 38.45	23 16 36.1	16 39.3	8.0267	7.999	2.41	
	23 23 17.4	174 5 22 50.33	22 53.75	23 16 50.3	16 53.5	8.0258	7.996	2.42	
	24 23 13.8	175 5 23 5.60	23 9.02	23 17 4.4	17 7.5	8.0248	7.992	2.43	
	25 23 10.1	176 5 23 20.83	23 24.24	23 17 18.4	17 21.4	8.0238	7.988	2.43	
	26 23 6.4	177 5 23 36.02	23 39.43	23 17 32.3	17 35.3	8.0227	7.984	2.44	
	27 23 2.7	178 5 23 51.18	23 54.58	23 17 46.1	17 49.1	8.0216	7.980	2.45	
	28 22 59.0	179 5 24 6.30	24 9.70	23 17 59.9	18 2.9	8.0204	7.976	-2.08	2.45
	29 22 55.4	180 5 24 21.38	24 24.77	23 18 13.5	18 16.4	8.0191	7.972	2.11	2.46
	30 22 51.7	181 5 24 36.40	24 39.78	23 18 26.9	18 29.8	8.0178	7.968	2.14	2.46
	31 22 48.0	182 5 24 51.37	24 54.74	+23 18 40.1	18 43.0	+8.0160	+7.963	-2.17	-2.47

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Sideral Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sideral Minutes.		Log Coefficient of t^2 .	
		At Sideral Oh.	At Transit.	At Sideral Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
July	d h m	d h m s	m s	+23 18' 53.2	18 56.1	+8.0144	+7.958	-2.19	-2.48
1 22 44.3	183	5 25 6.27	25 9.63	23 19 6.2	19 9.0	8.0127	7.953	2.20	2.48
2 22 40.6	184	5 25 21.13	25 24.48	23 19 19.0	19 21.8	8.0109	7.948	2.22	2.49
3 22 36.9	185	5 25 35.03	25 30.27	23 19 31.6	19 34.4	8.0090	7.943	2.23	2.49
4 22 33.2	186	5 25 50.67	25 54.00	23 19 44.1	19 46.8	8.0071	7.938	2.25	2.50
5 22 29.6	187	5 26 5.34	26 8.66	23 19 56.5	19 59.2	8.0050	7.933	2.26	2.50
6 22 25.9	188	5 26 19.94	26 23.25	23 20 8.6	20 11.3	8.0028	7.928	2.27	2.50
7 22 22.2	189	5 26 34.47	26 37.77	23 20 20.6	20 23.3	8.0005	7.923	2.29	2.51
8 22 18.5	190	5 26 48.93	26 52.21	23 20 32.6	20 35.2	7.9981	7.918	2.30	2.51
9 22 14.8	191	5 27 3.31	27 6.58	23 20 44.4	20 47.0	7.9957	7.913	2.32	2.51
10 22 11.1	192	5 27 17.61	27 20.86	23 20 56.1	20 58.7	7.9932	7.908	2.33	2.51
11 22 7.4	193	5 27 31.82	27 35.06	23 21 7.7	21 10.2	7.9906	7.903	2.34	2.51
12 22 3.7	194	5 27 45.96	27 49.18	23 21 19.2	21 21.7	7.9879	7.898	2.35	2.51
13 22 0.0	195	5 28 0.03	28 3.23	23 21 30.5	21 33.0	7.9851	7.893	2.36	2.52
14 21 56.3	196	5 28 14.00	28 17.18	23 21 41.7	21 44.2	7.9822	7.889	2.37	2.52
15 21 52.6	197	5 28 27.87	28 31.03	23 21 52.8	21 55.2	7.9791	7.884	2.38	2.52
16 21 48.0	198	5 28 41.65	28 44.79	23 22 3.7	22 6.1	7.9759	7.878	2.39	2.52
17 21 45.2	199	5 28 55.32	28 58.44	23 22 14.4	22 16.8	7.9726	7.872	2.40	2.52
18 21 41.5	200	5 29 8.89	29 11.90	23 22 24.9	22 27.2	7.9692	7.866	2.41	2.52
19 21 37.8	201	5 29 22.36	29 25.44	23 22 35.3	22 37.6	7.9658	7.859	2.42	2.52
20 21 34.1	202	5 29 35.72	29 38.77	23 22 45.6	22 47.9	7.9622	7.853	2.43	2.52
21 21 30.4	203	5 29 48.98	29 52.01	23 22 55.8	22 58.1	7.9585	7.847	2.44	2.52
22 21 26.7	204	5 30 2.12	30 5.12	23 23 6.0	23 8.2	7.9547	7.841	2.45	2.52
23 21 23.0	205	5 30 15.16	30 18.14	23 23 16.0	23 18.2	7.9508	7.835	2.45	2.52
24 21 19.3	206	5 30 28.68	30 31.03	23 23 25.8	23 27.9	7.9468	7.828	2.46	2.52
25 21 15.5	207	5 30 40.87	30 43.79	23 23 35.3	23 37.4	7.9426	7.821	2.47	2.51
26 21 11.8	208	5 30 53.54	30 56.43	23 23 44.6	23 46.7	7.9382	7.814	2.47	2.51
27 21 8.1	209	5 31 6.09	31 8.98	23 23 53.9	23 55.9	7.9336	7.807	2.48	2.51
28 21 4.4	210	5 31 18.51	31 21.34	23 24 3.0	24 5.0	7.9288	7.800	2.49	2.51
29 21 0.7	211	5 31 30.80	31 33.60	23 24 12.0	24 14.0	7.9239	7.794	2.50	2.51
30 20 56.9	212	5 31 42.05	31 45.72	23 24 20.9	24 22.9	7.9190	7.787	2.51	2.51
Aug. 1 20 53.2	213	5 31 54.97	31 57.71	23 24 29.7	24 31.6	7.9140	7.780	2.51	2.51
2 20 49.4	214	5 32 6.86	32 9.57	23 24 38.4	24 40.3	7.9089	7.773	2.52	2.50
3 20 45.7	215	5 32 28.62	32 31.30	23 24 46.9	24 48.8	7.9037	7.766	2.53	2.50
4 20 42.0	216	5 32 30.23	32 32.88	23 24 55.3	24 57.1	7.8983	7.759	2.53	2.50
5 20 38.2	217	5 32 41.69	32 44.31	23 25 3.4	25 5.2	7.8926	7.751	2.54	2.50
6 20 34.5	218	5 32 53.00	32 55.39	23 25 11.3	25 13.1	7.8867	7.743	2.55	2.50
7 20 30.7	219	5 33 4.14	33 6.70	23 25 19.0	25 20.8	7.8806	7.735	2.55	2.50
8 20 27.0	220	5 33 15.13	33 17.65	23 25 26.7	25 28.4	7.8743	7.727	2.56	2.50
9 20 23.2	221	5 33 25.98	33 28.47	23 25 34.2	25 35.9	7.8677	7.719	2.57	2.49
10 20 19.5	222	5 33 36.68	33 39.13	23 25 41.7	25 43.4	7.8610	7.710	2.58	2.49
11 20 15.8	223	5 33 47.22	33 49.64	23 25 49.1	25 50.7	7.8541	7.701	2.58	2.49
12 20 12.0	224	5 33 57.61	33 59.99	23 25 56.4	25 58.0	7.8470	7.692	2.59	2.49
13 20 8.2	225	5 34 7.83	34 10.17	23 26 3.5	26 5.1	7.8397	7.683	2.60	2.49
14 20 4.4	226	5 34 17.88	34 20.18	23 26 10.3	26 11.8	7.8324	7.674	2.60	2.49
15 20 0.6	227	5 34 27.76	34 30.02	23 26 16.9	26 18.4	7.8247	7.665	2.61	2.49
16 19 56.9	228	5 34 37.46	34 39.68	23 26 23.5	26 25.0	7.8167	7.656	2.62	2.48
17 19 53.1	229	5 34 47.00	34 49.18	23 26 29.9	26 31.4	7.8085	7.647	2.62	2.48
18 19 49.3	230	5 34 56.37	34 58.51	23 26 36.3	26 37.7	7.8001	7.638	2.63	2.48
19 19 45.5	231	5 35 5.56	35 7.66	23 26 42.5	26 43.9	7.7912	7.630	2.64	2.48
20 19 41.7	232	5 35 14.56	35 16.62	23 26 48.6	26 49.9	7.7822	7.621	2.64	2.48
21 19 37.9	233	5 35 23.37	35 25.39	23 26 54.5	26 55.8	7.7730	7.611	2.65	2.48
22 19 34.1	234	5 35 31.99	35 33.97	23 27 0.3	27 1.5	7.7636	7.601	2.65	2.47
23 19 30.3	235	5 35 40.44	35 42.38	23 27 5.9	27 7.2	7.7540	7.591	2.66	2.47
24 19 26.5	236	5 35 48.71	35 50.61	23 27 11.5	27 12.8	7.7440	7.582	2.66	2.47
25 19 22.7	237	5 35 56.79	35 58.64	23 27 17.0	27 18.2	7.7334	7.572	2.67	2.47
26 19 18.9	238	5 36 4.68	36 6.49	23 27 22.2	27 23.4	7.7223	7.561	2.67	2.47
27 19 15.1	239	5 36 12.39	36 14.16	23 27 27.2	27 28.4	7.7108	7.550	2.68	2.47
28 19 11.3	240	5 36 19.90	36 21.62	23 27 32.2	27 33.3	7.6987	7.539	2.68	2.46
29 19 7.5	241	5 36 27.21	36 28.89	23 27 37.1	27 38.2	7.6867	7.527	2.69	2.46
30 19 3.7	242	5 36 34.31	36 35.94	23 27 41.8	27 42.9	7.6742	7.515	2.69	2.46
31 18 59.9	243	5 36 41.20	36 42.79	23 27 46.5	27 47.5	+7.6612	+7.503	-2.69	-2.46
31 18 56.1	244	5 36 47.91	36 49.45						

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Sept. 1 18 52.3	245	d h m s	m s	+23 27 51.1	27 52.1	+7.6477	+7.491	-2.70	-2.46
2 18 48.5	246	5 37 0.72	37 2.16	23 27 55.6	27 56.6	7.6337	7.479	2.70	2.46
3 18 44.6	247	5 37 6.81	37 8.20	23 27 59.9	28 0.0	7.6190	7.465	2.70	2.45
4 18 40.8	248	5 37 12.70	37 14.05	23 28 4.1	28 5.0	7.6035	7.451	2.71	2.45
5 18 37.0	249	5 37 18.38	37 19.68	23 28 8.0	28 8.9	7.5872	7.437	2.71	2.45
6 18 33.1	250	5 37 23.85	37 25.10	23 28 11.8	28 12.7	7.5701	7.423	2.71	2.45
7 18 29.3	251	5 37 29.10	37 30.30	23 28 15.5	28 16.3	7.5521	7.409	2.72	2.45
8 18 25.4	252	5 37 34.13	37 35.28	23 28 19.2	28 20.0	7.5336	7.394	2.72	2.45
9 18 21.6	253	5 37 38.94	37 40.04	23 28 22.8	28 23.6	7.5143	7.379	2.72	2.44
10 18 17.8	254	5 37 43.52	37 44.57	23 28 26.2	28 26.9	7.4941	7.363	2.72	2.44
11 18 13.9	255	5 37 47.89	37 48.89	23 28 29.4	28 30.1	7.4731	7.347	2.73	2.44
12 18 10.0	256	5 37 52.05	37 53.00	23 28 32.6	28 33.3	7.4510	7.330	2.73	2.44
13 18 6.1	257	5 37 55.99	37 56.89	23 28 35.6	28 36.3	7.4269	7.314	2.73	2.44
14 18 2.3	258	5 37 59.71	38 0.56	23 28 38.5	28 39.1	7.4001	7.296	2.73	2.43
15 17 58.4	259	5 38 3.22	38 4.02	23 28 41.3	28 41.9	7.3730	7.277	2.73	2.43
16 17 54.5	260	5 38 6.51	38 7.26	23 28 44.0	28 44.6	7.3447	7.257	2.74	2.43
17 17 50.6	261	5 38 9.58	38 10.28	23 28 46.6	28 47.1	7.3121	7.236	2.74	2.43
18 17 46.7	262	5 38 12.42	38 13.06	23 28 49.0	28 49.5	7.2770	7.212	2.74	2.43
19 17 42.8	263	5 38 15.03	38 15.62	23 28 51.3	28 51.8	7.2388	7.189	2.74	2.42
20 17 38.9	264	5 38 17.41	38 17.95	23 28 53.5	28 53.9	7.1976	7.165	2.74	2.42
21 17 35.0	265	5 38 19.57	38 20.06	23 28 55.5	28 55.9	7.1533	7.140	2.74	2.42
22 17 31.1	266	5 38 21.51	38 21.94	23 28 57.5	28 57.9	7.1040	7.114	2.74	2.42
23 17 27.2	267	5 38 23.23	38 23.61	23 28 59.4	28 59.8	7.0484	7.087	2.73	2.42
24 17 23.3	268	5 38 24.72	38 25.05	23 29 1.1	29 1.4	6.9783	7.058	2.73	2.41
25 17 19.4	269	5 38 25.97	38 26.24	23 29 2.6	29 2.9	6.8966	7.027	2.73	2.41
26 17 15.5	270	5 38 26.99	38 27.21	23 29 4.1	29 4.4	6.7958	6.994	2.73	2.41
27 17 11.6	271	5 38 27.78	38 27.94	23 29 5.4	29 5.6	6.6696	6.959	2.73	2.41
28 17 7.6	272	5 38 28.34	38 28.45	23 29 6.7	29 6.9	6.4850	6.921	2.72	2.40
29 17 3.7	273	5 38 28.68	38 28.73	23 29 7.8	29 8.0	6.2033	6.881	2.72	2.40
30 16 59.8	274	5 38 28.80	38 28.80	23 29 8.7	29 8.8	+5.3200	6.840	2.72	2.40
Oct. 1 16 55.9	275	5 38 28.69	38 28.64	23 29 9.5	29 9.6	-6.1840	6.770	2.72	2.41
2 16 51.9	276	5 38 28.37	38 28.26	23 29 10.3	29 10.4	6.4948	6.690	2.72	2.41
3 16 48.0	277	5 38 27.81	38 27.64	23 29 10.9	29 11.0	6.6677	6.600	2.71	2.41
4 16 44.0	278	5 38 27.02	38 26.80	23 29 11.4	29 11.5	6.8054	6.495	2.71	2.41
5 16 40.1	279	5 38 25.98	38 25.71	23 29 11.8	29 11.8	6.9060	6.356	2.71	2.42
6 16 36.1	280	5 38 24.71	38 24.38	23 29 12.1	29 12.1	6.9814	6.143	2.71	2.42
7 16 32.2	281	5 38 23.22	38 22.84	23 29 12.2	29 12.2	7.0457	+5.824	2.70	2.42
8 16 28.2	282	5 38 21.51	38 21.08	23 29 12.3	29 12.3	7.1040	-5.824	2.70	2.43
9 16 24.3	283	5 38 19.57	38 19.09	23 29 12.2	29 12.2	7.1603	6.140	2.70	2.43
10 16 20.3	284	5 38 17.41	38 16.88	23 29 12.1	29 12.0	7.2056	6.300	2.70	2.43
11 16 16.3	285	5 38 15.03	38 14.45	23 29 11.7	29 11.6	7.2437	6.440	2.70	2.44
12 16 12.3	286	5 38 12.44	38 11.81	23 29 11.3	29 11.2	7.2781	6.555	2.69	2.44
13 16 8.4	287	5 38 9.62	38 8.94	23 29 10.8	29 10.7	7.3107	6.645	2.69	2.45
14 16 4.4	288	5 38 6.58	38 5.85	23 29 10.2	29 10.1	7.3415	6.715	2.69	2.45
15 16 0.4	289	5 38 3.31	38 2.53	23 29 9.5	29 9.3	7.3705	6.770	2.69	2.46
16 15 56.4	290	5 37 59.82	37 58.99	23 29 8.5	29 8.4	7.3984	6.820	2.68	2.46
17 15 52.4	291	5 37 56.13	37 55.25	23 29 7.5	29 7.3	7.4234	6.867	2.68	2.46
18 15 48.4	292	5 37 52.22	37 51.29	23 29 6.4	29 6.2	7.4464	6.911	2.68	2.47
19 15 44.4	293	5 37 48.11	37 47.13	23 29 5.2	29 5.0	7.4679	6.954	2.68	2.47
20 15 40.4	294	5 37 43.79	37 42.76	23 29 3.9	29 3.7	7.4880	6.995	2.67	2.47
21 15 36.3	295	5 37 39.26	37 38.18	23 29 2.4	29 2.2	7.5077	7.035	2.67	2.47
22 15 32.3	296	5 37 34.52	37 33.39	23 29 0.8	29 0.5	7.5267	7.073	2.67	2.48
23 15 28.3	297	5 37 29.57	37 28.39	23 28 59.1	28 58.8	7.5450	7.108	2.66	2.48
24 15 24.3	298	5 37 24.42	37 23.19	23 28 57.3	28 57.0	7.5626	7.138	2.66	2.48
25 15 20.3	299	5 37 19.06	37 17.79	23 28 55.3	28 55.0	7.5796	7.164	2.66	2.48
26 15 16.3	300	5 37 13.49	37 12.17	23 28 53.1	28 52.7	7.5956	7.187	2.65	2.48
27 15 12.2	301	5 37 7.73	37 6.37	23 28 50.8	28 50.4	7.6106	7.207	2.65	2.48
28 15 8.2	302	5 37 1.77	37 0.36	23 28 48.4	28 48.0	7.6246	7.226	2.65	2.48
29 15 4.2	303	5 36 55.62	36 54.16	23 28 45.9	28 45.4	7.6376	7.245	2.64	2.47
30 15 0.2	304	5 36 49.28	36 47.78	23 28 43.5	28 43.0	7.6498	7.264	2.64	2.47
31 14 56.1	305	5 36 42.77	36 41.22	23 28 40.9	28 40.4	7.6618	7.283	2.64	2.47
32 14 52.1	306	5 36 36.07	36 34.48	+23 28 38.2	28 37.6	-7.6736	-7.302	-2.63	-2.47

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Nov. 1 14 52.1	306	5 36 36.07	36 34.48	+23 28 38.2	28 37.6	-7.6736	-7.302	-2.63	-2.47
2 14 48.0	307	5 36 29.19	36 27.56	23 28 35.2	28 34.6	7.6851	7.320	2.62	2.47
3 14 44.0	308	5 36 22.13	36 20.46	23 28 32.0	28 31.3	7.6963	7.337	2.61	2.47
4 14 39.9	309	5 36 14.88	36 13.17	23 28 28.7	28 28.0	7.7073	7.353	2.60	2.47
5 14 35.9	310	5 36 7.45	36 5.70	23 28 25.2	28 24.5	7.7178	7.369	2.59	2.47
6 14 31.8	311	5 35 59.85	35 58.06	23 28 21.8	28 21.0	7.7276	7.385	2.58	2.46
7 14 27.7	312	5 35 52.07	35 50.24	23 28 18.2	28 17.4	7.7370	7.401	2.58	2.46
8 14 23.7	313	5 35 44.13	35 42.26	23 28 14.5	28 13.7	7.7460	7.417	2.57	2.46
9 14 19.6	314	5 35 36.02	35 34.12	23 28 10.6	28 9.7	7.7543	7.433	2.56	2.46
10 14 15.5	315	5 35 27.76	35 25.82	23 28 6.6	28 5.7	7.7624	7.448	2.55	2.46
11 14 11.4	316	5 35 19.36	35 17.39	23 28 2.5	28 1.6	7.7702	7.460	2.54	2.45
12 14 7.4	317	5 35 10.80	35 8.79	23 27 58.3	27 57.3	7.7777	7.472	2.53	2.45
13 14 3.3	318	5 35 2.09	35 0.04	23 27 54.0	27 53.0	7.7849	7.483	2.52	2.45
14 13 59.2	319	5 34 53.24	34 51.16	23 27 49.5	27 48.5	7.7920	7.495	2.50	2.45
15 13 55.1	320	5 34 44.25	34 42.14	23 27 44.9	27 43.8	7.7989	7.507	2.49	2.45
16 13 51.0	321	5 34 35.12	34 32.98	23 27 40.2	27 39.1	7.8055	7.518	2.47	2.44
17 13 46.9	322	5 34 25.86	34 23.69	23 27 35.4	27 34.3	7.8118	7.529	2.46	2.44
18 13 42.8	323	5 34 16.47	34 14.27	23 27 30.5	27 29.3	7.8178	7.540	2.44	2.44
19 13 38.8	324	5 34 6.94	34 4.71	23 27 25.3	27 24.1	7.8234	7.550	2.42	2.44
20 13 34.7	325	5 33 57.29	33 55.03	23 27 20.1	27 18.9	7.8288	7.560	2.40	2.43
21 13 30.6	326	5 33 47.54	33 45.26	23 27 14.8	27 13.6	7.8340	7.570	2.38	2.43
22 13 26.5	327	5 33 37.69	33 35.38	23 27 9.4	27 8.1	7.8389	7.580	2.36	2.43
23 13 22.4	328	5 33 27.75	33 25.42	23 27 3.9	27 2.6	7.8435	7.589	2.34	2.42
24 13 18.3	329	5 33 17.71	33 15.36	23 26 58.3	26 57.0	7.8480	7.598	2.32	2.42
25 13 14.2	330	5 33 7.56	33 5.19	23 26 52.5	26 51.2	7.8521	7.607	2.29	2.41
26 13 10.1	331	5 32 57.30	32 54.91	23 26 46.6	26 45.2	7.8559	7.615	2.27	2.41
27 13 6.0	332	5 32 46.94	32 44.53	23 26 40.6	26 39.2	7.8594	7.622	2.24	2.40
28 13 1.9	333	5 32 36.49	32 34.06	23 26 34.5	26 33.1	7.8627	7.629	2.22	2.40
29 12 57.8	334	5 32 25.95	32 23.51	23 26 28.3	26 26.9	7.8657	7.634	2.19	2.39
30 12 53.7	335	5 32 15.34	32 12.88	23 26 22.0	26 20.6	7.8686	7.640	2.16	2.38
Dec. 1 12 49.6	336	5 32 4.67	32 2.20	23 26 15.6	26 14.1	7.8713	7.646	2.12	2.37
2 12 45.5	337	5 31 53.93	31 51.45	23 26 9.1	26 7.6	7.8738	7.652	-2.08	2.36
3 12 41.4	338	5 31 43.14	31 40.65	23 26 2.5	26 1.0	7.8761	7.658		2.35
4 12 37.3	339	5 31 32.29	31 29.79	23 25 55.8	25 54.3	7.8782	7.665		2.34
5 12 33.2	340	5 31 21.38	31 18.87	23 25 49.0	25 47.5	7.8802	7.670		2.33
6 12 29.1	341	5 31 10.42	31 7.91	23 25 42.1	25 40.5	7.8820	7.675		2.32
7 12 25.0	342	5 30 59.42	30 56.90	23 25 35.1	25 33.5	7.8836	7.680		2.31
8 12 20.9	343	5 30 48.39	30 45.87	23 25 28.0	25 26.4	7.8850	7.685		2.30
9 12 16.7	344	5 30 37.33	30 34.80	23 25 21.0	25 19.4	7.8861	7.690		2.29
10 12 12.6	345	5 30 26.24	30 23.71	23 25 13.9	25 12.3	7.8871	7.695		2.27
11 12 8.5	346	5 30 15.12	30 12.59	23 25 6.6	25 4.9	7.8879	7.700		2.26
12 12 4.4	347	5 30 3.99	30 1.46	23 24 59.1	24 57.4	7.8885	7.704		2.25
13 12 0.3	348	5 29 52.85	29 50.32	23 24 51.9	24 50.2	7.8889	7.708		2.23
14 11 56.1	349	5 29 41.71	29 39.18	23 24 44.4	24 42.7	7.8890	7.712		2.21
15 11 52.0	350	5 29 30.56	29 28.03	23 24 36.9	24 35.2	7.8888	7.716		2.19
16 11 47.9	351	5 29 19.41	29 16.89	23 24 29.4	24 27.7	7.8886	7.720		2.18
17 11 43.8	352	5 29 8.27	29 5.75	23 24 21.7	24 20.0	7.8883	7.724		2.16
18 11 39.7	353	5 28 57.14	28 54.62	23 24 14.0	24 12.2	7.8879	7.727		2.14
19 11 35.5	354	5 28 46.01	28 43.49	23 24 6.4	24 4.6	7.8873	7.730		2.12
20 11 31.4	355	5 28 34.90	28 32.39	23 23 58.6	23 56.8	7.8864	7.733		2.10
21 11 27.3	356	5 28 23.83	28 21.32	23 23 50.9	23 49.1	7.8852	7.736	-2.08	
22 11 23.2	357	5 28 12.81	28 10.31	23 23 43.1	23 41.3	7.8837	7.738		
23 11 19.1	358	5 28 1.83	27 59.34	23 23 35.3	23 33.5	7.8819	7.740		
24 11 14.9	359	5 27 50.89	27 48.41	23 23 27.4	23 25.6	7.8798	7.742		
25 11 10.8	360	5 27 39.99	27 37.52	23 23 19.5	23 17.7	7.8778	7.744	+2.08	
26 11 6.7	361	5 27 29.15	27 26.69	23 23 11.6	23 9.8	7.8757	7.746		2.12
27 11 2.6	362	5 27 18.37	27 15.92	23 23 3.6	23 1.8	7.8734	7.747		2.16
28 10 58.5	363	5 27 7.66	27 5.23	23 22 55.6	22 53.8	7.8709	7.748		2.19
29 10 54.4	364	5 26 57.00	26 54.59	23 22 47.7	22 45.9	7.8681	7.749		2.22
30 10 50.3	365	5 26 46.41	26 44.01	23 22 39.7	22 37.9	7.8651	7.750		2.25
31 10 46.2	366	5 26 35.89	26 33.51	23 22 31.8	22 30.0	7.8618	7.750		2.27
32 10 42.1	367	5 26 25.45	26 23.08	+23 22 23.9	22 22.1	-7.8583	-7.751	+2.30	

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Jan. 0 5 26.2	0	0 6 35.59	6 35.60	0 49 31.2	49 31.1	+7.2191	+8.103	+2.47	+3.28
1 5 22.3	1	0 6 38.02	6 38.03	0 49 12.5	49 12.4	7.2408	8.121	2.47	3.28
2 5 18.4	2	0 6 40.59	6 40.60	0 48 53.1	48 53.0	7.2616	8.138	2.47	3.28
3 5 14.5	3	0 6 43.28	6 43.29	0 48 32.9	48 32.8	7.2817	8.154	2.46	3.27
4 5 10.6	4	0 6 46.09	6 46.10	0 48 12.0	48 11.9	7.2992	8.170	2.46	3.27
5 5 6.8	5	0 6 49.01	6 49.03	0 47 50.3	47 50.2	7.3173	8.186	2.46	3.27
6 5 2.9	6	0 6 52.06	6 52.08	0 47 27.8	47 27.7	7.3344	8.200	2.46	3.27
7 4 59.0	7	0 6 55.23	6 55.25	0 47 4.6	47 4.5	7.3508	8.214	2.45	3.26
8 4 55.1	8	0 6 58.52	6 58.54	0 46 40.6	46 40.5	7.3666	8.229	2.45	3.26
9 4 51.3	9	0 7 1.93	7 1.95	0 46 15.8	46 15.7	7.3825	8.242	2.45	3.26
10 4 47.4	10	0 7 5.48	7 5.48	0 45 50.3	45 50.2	7.3965	8.255	2.45	3.25
11 4 43.5	11	0 7 9.10	7 9.12	0 45 24.0	45 23.9	7.4104	8.267	2.44	3.25
12 4 39.6	12	0 7 12.86	7 12.88	0 44 57.0	44 56.9	7.4225	8.279	2.44	3.25
13 4 35.8	13	0 7 16.73	7 16.75	0 44 29.3	44 29.2	7.4365	8.290	2.44	3.24
14 4 32.0	14	0 7 20.72	7 20.74	0 44 0.9	44 0.8	7.4485	8.301	2.44	3.24
15 4 28.1	15	0 7 24.82	7 24.84	0 43 31.8	43 31.7	7.4596	8.311	2.43	3.24
16 4 24.2	16	0 7 29.03	7 29.05	0 43 1.9	43 1.8	7.4725	8.322	2.43	3.23
17 4 20.4	17	0 7 33.36	7 33.39	0 42 31.3	42 31.1	7.4836	8.332	2.43	3.23
18 4 16.5	18	0 7 37.80	7 37.83	0 42 0.0	41 59.8	7.4948	8.342	2.42	3.22
19 4 12.6	19	0 7 42.35	7 42.38	0 41 28.0	41 27.8	7.5039	8.351	2.42	3.22
20 4 8.7	20	0 7 47.00	7 47.03	0 40 55.4	40 55.2	7.5142	8.360	2.41	3.21
21 4 4.9	21	0 7 51.76	7 51.79	0 40 22.1	40 21.9	7.5246	8.368	2.41	3.20
22 4 1.0	22	0 7 56.63	7 56.66	0 39 48.2	39 48.0	7.5331	8.376	2.40	3.20
23 3 57.2	23	0 8 1.60	8 1.63	0 39 13.6	39 13.4	7.5432	8.385	2.40	3.19
24 3 53.3	24	0 8 6.68	8 6.71	0 38 38.3	38 38.1	7.5517	8.393	2.39	3.19
25 3 49.5	25	0 8 11.86	8 11.89	0 38 2.4	38 2.2	7.5601	8.400	2.38	3.18
26 3 45.6	26	0 8 17.14	8 17.17	0 37 25.9	37 25.7	7.5683	8.407	2.38	3.18
27 3 41.8	27	0 8 22.52	8 22.55	0 36 48.8	36 48.6	7.5764	8.414	2.37	3.17
28 3 37.9	28	0 8 27.99	8 28.02	0 36 11.1	36 10.9	7.5847	8.421	2.37	3.16
29 3 34.1	29	0 8 33.57	8 33.60	0 35 32.8	35 32.6	7.5917	8.428	2.36	3.15
30 3 30.2	30	0 8 39.24	8 39.27	0 34 53.9	34 53.7	7.5986	8.434	2.36	3.15
31 3 26.4	31	0 8 45.00	8 45.03	0 34 14.5	34 14.3	7.6054	8.440	2.35	3.14
Feb. 1 3 22.6	32	0 8 50.85	8 50.88	0 33 34.5	33 34.3	7.6121	8.447	2.34	3.13
2 3 18.8	33	0 8 56.79	8 56.83	0 32 53.9	32 53.6	7.6187	8.453	2.33	3.12
3 3 14.9	34	0 9 2.82	9 2.86	0 32 12.8	32 12.5	7.6252	8.458	2.33	3.11
4 3 11.1	35	0 9 8.94	9 8.98	0 31 31.2	31 30.9	7.6323	8.464	2.32	3.10
5 3 7.3	36	0 9 15.14	9 15.18	0 30 49.0	30 48.7	7.6378	8.469	2.31	3.09
6 3 3.5	37	0 9 21.43	9 21.47	0 30 6.3	30 6.0	7.6433	8.475	2.30	3.08
7 2 59.6	38	0 9 27.80	9 27.84	0 29 23.1	29 22.8	7.6488	8.480	2.30	3.07
8 2 55.8	39	0 9 34.25	9 34.29	0 28 39.4	28 39.2	7.6541	8.484	2.29	3.06
9 2 52.0	40	0 9 40.78	9 40.82	0 27 55.3	27 55.0	7.6595	8.489	2.28	3.06
10 2 48.2	41	0 9 47.40	9 47.45	0 27 10.7	27 10.4	7.6644	8.493	2.27	3.04
11 2 44.3	42	0 9 54.09	9 54.14	0 26 25.6	26 25.3	7.6689	8.498	2.26	3.03
12 2 40.5	43	0 10 0.86	10 0.91	0 25 40.1	25 39.8	7.6744	8.502	2.25	3.02
13 2 36.7	44	0 10 7.70	10 7.75	0 24 54.1	24 53.8	7.6789	8.506	2.24	3.01
14 2 32.9	45	0 10 14.61	10 14.66	0 24 7.7	24 7.4	7.6833	8.510	2.23	3.00
15 2 29.1	46	0 10 21.59	10 21.64	0 23 20.9	23 20.6	7.6876	8.514	2.22	2.99
16 2 25.3	47	0 10 28.64	10 28.69	0 22 33.7	22 33.4	7.6919	8.517	2.21	2.98
17 2 21.5	48	0 10 35.76	10 35.81	0 21 46.1	21 45.8	7.6965	8.521	2.20	2.97
18 2 17.7	49	0 10 42.96	10 43.00	0 20 58.0	20 57.6	7.7001	8.525	2.19	2.96
19 2 13.8	50	0 10 50.20	10 50.25	0 20 9.6	20 9.2	7.7037	8.528	2.18	2.94
20 2 10.0	51	0 10 57.51	10 57.56	0 19 20.9	19 20.5	7.7073	8.531	2.17	2.92
21 2 6.2	52	0 11 4.88	11 4.93	0 18 31.8	18 31.4	7.7108	8.534	2.15	2.90
22 2 2.4	53	0 11 12.31	11 12.36	0 17 42.4	17 42.0	7.7146	8.537	2.13	2.88
23 1 58.6	54	0 11 19.79	11 19.84	0 16 52.7	16 52.3	7.7175	8.539	2.12	2.87
24 1 54.8	55	0 11 27.33	11 27.38	0 16 2.7	16 2.3	7.7204	8.542	2.10	2.85
25 1 51.0	56	0 11 34.92	11 34.97	0 15 12.4	15 12.0	7.7233	8.544	2.09	2.83
26 1 47.2	57	0 11 42.57	11 42.63	0 14 21.7	14 21.3	7.7261	8.547	2.07	2.81
27 1 43.4	58	0 11 50.26	11 50.32	0 13 30.8	13 30.4	7.7290	8.550	2.06	2.79
28 1 39.6	59	0 11 58.00	11 58.06	0 12 39.6	12 39.2	7.7320	8.552	2.04	2.77
29 1 35.8	60	0 12 5.79	12 5.85	0 11 48.2	11 47.8	7.7343	8.553	2.02	2.75
30 1 32.0	61	0 12 13.62	12 13.68	0 10 56.6	10 56.2	+7.7365	+8.555	+2.00	+2.72

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. 1 1 35.8	60	0 12 5.79	12 5.85	- 0 11 48.2	11 47.8	+7.7343	+8.553	+2.02	+2.75
2 1 32.0	61	0 12 13.62	12 13.68	0 10 56.6	10 56.2	7.7365	8.555	2.00	2.72
3 1 23.2	62	0 12 21.49	12 21.55	0 10 4.8	10 4.4	7.7387	8.557	1.98	2.70
4 1 24.4	63	0 12 29.40	12 29.46	0 9 12.8	9 12.4	7.7409	8.558	1.96	2.68
5 1 20.6	64	0 12 37.35	12 37.41	0 8 20.5	8 20.1	7.7430	8.560	1.94	2.65
6 1 16.8	65	0 12 45.34	12 45.41	0 7 28.0	7 27.6	7.7450	8.562	1.92	+2.62
7 1 13.0	66	0 12 53.36	12 53.43	0 6 35.4	6 35.0	7.7466	8.563	1.90	
8 1 9.2	67	0 13 1.41	13 1.48	0 5 42.6	5 42.2	7.7482	8.565	1.88	
9 1 5.4	68	0 13 9.49	13 9.56	0 4 49.7	4 49.3	7.7498	8.566	1.86	
10 1 1.6	69	0 13 17.61	13 17.68	0 3 56.6	3 56.2	7.7515	8.567	1.83	
11 0 57.8	70	0 13 25.75	13 25.82	0 3 3.4	3 3.0	7.7531	8.568	1.80	
12 0 54.0	71	0 13 33.92	13 33.99	0 2 10.1	2 9.7	7.7545	8.569	1.77	
13 0 50.2	72	0 13 42.11	13 42.18	0 1 16.7	1 16.3	7.7559	8.569	1.74	
14 0 46.4	73	0 13 50.33	13 50.41	- 0 0 23.1	0 22.6	7.7570	8.570	1.70	
15 0 42.6	74	0 13 58.57	13 58.65	+ 0 0 30.5	0 31.0	7.7581	8.571	+1.65	
16 0 38.8	75	0 14 6.82	14 6.90	0 1 24.2	1 24.7	7.7501	8.572		
17 0 35.0	76	0 14 15.09	14 15.15	0 2 17.9	2 18.4	7.7509	8.572		
18 0 31.2	77	0 14 23.38	14 23.46	0 3 11.6	3 12.1	7.7605	8.572		
19 0 27.4	78	0 14 31.68	14 31.76	0 4 5.4	4 5.9	7.7610	8.572		
20 0 23.6	79	0 14 39.99	14 40.07	0 4 59.2	4 59.7	7.7615	8.573		
21 0 19.8	80	0 14 48.31	14 48.39	0 5 53.1	5 53.6	7.7620	8.573		
22 0 16.1	81	0 14 56.64	14 56.73	0 6 47.0	6 47.5	7.7625	8.573		
23 0 12.3	82	0 15 4.96	15 5.07	0 7 40.8	7 41.3	7.7628	8.573		
24 0 8.5	83	0 15 13.32	15 13.41	0 8 34.6	8 35.1	7.7628	8.572		
25 0 4.7	84	0 15 21.65	15 21.74	0 9 28.3	9 28.8	7.7625	8.571		
26 0 0.9	85	0 15 29.97	15 30.06	0 10 21.9	10 22.4	7.7622	8.571		
26 23 57.1	86	0 15 38.28	15 38.37	0 11 15.5	11 16.0	7.7619	8.570		
27 23 53.3	87	0 15 46.60	15 46.69	0 12 9.0	12 9.5	7.7616	8.569		
28 23 49.5	88	0 15 54.91	15 55.00	0 13 2.4	13 2.9	7.7613	8.569		
29 23 45.7	89	0 16 3.22	16 3.31	0 13 55.7	13 56.2	7.7610	8.568		
30 23 41.9	90	0 16 11.52	16 11.62	0 14 48.9	14 49.4	7.7605	8.567		
31 23 38.1	91	0 16 19.81	16 19.91	0 15 41.9	15 42.5	7.7599	8.566		
Apr. 1 23 34.3	92	0 16 28.09	16 28.19	0 16 34.8	16 35.4	7.7593	8.565		
2 23 30.5	93	0 16 36.36	16 36.45	0 17 27.6	17 28.2	7.7586	8.563		
3 23 26.8	94	0 16 44.60	16 44.70	0 18 20.2	18 20.8	7.7575	8.562	-1.64	-2.61
4 23 23.0	95	0 16 52.83	16 52.93	0 19 12.6	19 13.2	7.7565	8.560	1.69	2.64
5 23 19.2	96	0 17 1.04	17 1.14	0 20 4.9	20 5.5	7.7554	8.559	1.73	2.67
6 23 15.4	97	0 17 9.23	17 9.33	0 20 57.0	20 57.6	7.7544	8.558	1.76	2.69
7 23 11.6	98	0 17 17.39	17 17.49	0 21 48.9	21 49.5	7.7531	8.556	1.79	2.71
8 23 7.8	99	0 17 25.53	17 25.63	0 22 40.6	22 41.2	7.7515	8.554	1.82	2.74
9 23 4.0	100	0 17 33.64	17 33.74	0 23 32.1	23 32.7	7.7498	8.552	1.85	2.76
10 23 0.2	101	0 17 41.72	17 41.82	0 24 23.3	24 23.9	7.7482	8.550	1.87	2.78
11 22 56.4	102	0 17 49.77	17 49.87	0 25 14.2	25 14.8	7.7466	8.548	1.89	2.80
12 22 52.6	103	0 17 57.79	17 57.89	0 26 4.9	26 5.5	7.7450	8.545	1.92	2.82
13 22 48.8	104	0 18 5.77	18 5.87	0 26 55.3	26 55.9	7.7431	8.543	1.94	2.84
14 22 45.0	105	0 18 13.72	18 13.82	0 27 45.4	27 46.0	7.7409	8.541	1.96	2.86
15 22 41.2	106	0 18 21.63	18 21.73	0 28 35.3	28 35.9	7.7387	8.538	1.98	2.87
16 22 37.4	107	0 18 29.50	18 29.60	0 29 24.9	29 25.5	7.7365	8.535	2.00	2.89
17 22 33.6	108	0 18 37.33	18 37.43	0 30 14.1	30 14.7	7.7343	8.532	2.02	2.91
18 22 29.8	109	0 18 45.11	18 45.21	0 31 3.0	31 3.6	7.7318	8.529	2.04	2.92
19 22 26.0	110	0 18 52.85	18 52.95	0 31 51.5	31 52.1	7.7290	8.526	2.05	2.93
20 22 22.2	111	0 19 0.54	19 0.64	0 32 39.7	32 40.3	7.7261	8.523	2.07	2.94
21 22 18.4	112	0 19 8.18	19 8.28	0 33 27.5	33 28.1	7.7233	8.520	2.09	2.96
22 22 14.6	113	0 19 15.77	19 15.87	0 34 14.9	34 15.5	7.7204	8.517	2.10	2.97
23 22 10.8	114	0 19 23.32	19 23.42	0 35 2.0	35 2.6	7.7175	8.513	2.11	2.98
24 22 7.0	115	0 19 30.81	19 30.91	0 35 48.7	35 49.3	7.7145	8.509	2.12	2.99
25 22 3.2	116	0 19 38.24	19 38.34	0 36 35.0	36 35.6	7.7114	8.505	2.13	3.00
26 21 59.4	117	0 19 45.62	19 45.72	0 37 20.8	37 21.4	7.7079	8.501	2.14	3.01
27 21 55.6	118	0 19 52.94	19 53.04	0 38 6.2	38 6.8	7.7043	8.497	2.15	3.02
28 21 51.8	119	0 20 0.20	20 0.30	0 38 51.2	38 51.8	7.7007	8.492	2.16	3.03
29 21 48.0	120	0 20 7.40	20 7.50	0 39 35.7	39 36.3	7.6971	8.488	2.17	3.04
30 21 44.2	121	0 20 14.53	20 14.63	+ 0 40 19.8	40 20.4	+7.6933	+8.484	-2.18	-3.05

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

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		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
May 1 21 40.3	122	0 20 21.61	20 21.70	+ 0 41' 3.5	41' 4.1	+7.6895	+8.479	-2.19	-3.05
2 21 36.5	123	0 20 23.61	20 23.70	0 41 46.7	41 47.3	7.6848	8.475	2.20	3.06
3 21 32.7	124	0 20 35.55	20 35.64	0 42 29.4	42 30.0	7.6814	8.470	2.21	3.07
4 21 28.9	125	0 20 42.43	20 42.52	0 43 11.6	43 12.2	7.6770	8.465	2.22	3.08
5 21 25.0	126	0 20 49.24	20 49.33	0 43 53.4	43 54.0	7.6725	8.460	2.23	3.08
6 21 21.2	127	0 20 55.98	20 56.07	0 44 34.7	44 35.3	7.6683	8.455	2.24	3.09
7 21 17.4	128	0 21 2.64	21 2.73	0 45 15.5	45 16.1	7.6631	8.450	2.25	3.10
8 21 13.6	129	0 21 9.23	21 9.32	0 45 55.7	45 56.3	7.6578	8.444	2.26	3.11
9 21 9.7	130	0 21 15.74	21 15.83	0 46 35.4	46 36.0	7.6521	8.438	2.27	3.11
10 21 5.9	131	0 21 22.17	21 22.26	0 47 14.6	47 15.2	7.6478	8.432	2.28	3.12
11 21 2.1	132	0 21 28.53	21 28.62	0 47 53.2	47 53.8	7.6423	8.426	2.29	3.13
12 20 58.3	133	0 21 34.81	21 34.90	0 48 31.3	48 31.9	7.6368	8.419	2.30	3.14
13 20 54.4	134	0 21 41.01	21 41.10	0 49 8.8	49 9.4	7.6312	8.412	2.30	3.14
14 20 50.6	135	0 21 47.13	21 47.22	0 49 45.7	49 46.3	7.6259	8.406	2.31	3.15
15 20 46.8	136	0 21 53.16	21 53.25	0 50 22.0	50 22.6	7.6194	8.398	2.32	3.15
16 20 43.0	137	0 21 59.11	21 59.20	0 50 57.8	50 58.4	7.6129	8.391	2.33	3.16
17 20 39.1	138	0 22 4.97	22 5.06	0 51 33.0	51 33.5	7.6062	8.384	2.33	3.16
18 20 35.3	139	0 22 10.74	22 10.82	0 52 7.6	52 8.1	7.5994	8.376	2.34	3.17
19 20 31.5	140	0 22 16.42	22 16.50	0 52 41.5	52 42.0	7.5925	8.368	2.34	3.17
20 20 27.7	141	0 22 22.01	22 22.09	0 53 14.8	53 15.3	7.5855	8.360	2.35	3.17
21 20 23.8	142	0 22 27.52	22 27.60	0 53 47.5	53 48.0	7.5784	8.352	2.35	3.18
22 20 20.0	143	0 22 32.93	22 33.01	0 54 19.6	54 20.1	7.5712	8.344	2.36	3.18
23 20 16.2	144	0 22 38.24	22 38.32	0 54 51.0	54 51.5	7.5638	8.335	2.36	3.18
24 20 12.3	145	0 22 43.46	22 43.54	0 55 21.8	55 22.3	7.5559	8.326	2.37	3.19
25 20 8.4	146	0 22 48.59	22 48.66	0 55 51.9	55 52.4	7.5475	8.316	2.37	3.19
26 20 4.6	147	0 22 53.62	22 53.69	0 56 21.4	56 21.9	7.5388	8.306	2.37	3.20
27 20 0.7	148	0 22 58.55	22 58.62	0 56 50.2	56 50.7	7.5300	8.296	2.38	3.20
28 19 56.9	149	0 23 3.38	23 3.45	0 57 18.4	57 18.8	7.5210	8.286	2.38	3.21
29 19 53.0	150	0 23 8.12	23 8.19	0 57 45.9	57 46.3	7.5118	8.275	2.38	3.21
30 19 49.2	151	0 23 12.75	23 12.82	0 58 12.7	58 13.1	7.5025	8.264	2.39	3.22
31 19 45.3	152	0 23 17.28	23 17.35	0 58 38.8	58 39.2	7.4929	8.253	2.39	3.22
June 1 19 41.4	153	0 23 21.71	23 21.78	0 59 4.3	59 4.7	7.4831	8.242	2.40	3.22
2 19 37.5	154	0 23 26.04	23 26.10	0 59 29.1	59 29.5	7.4728	8.230	2.40	3.23
3 19 33.7	155	0 23 30.27	23 30.33	0 59 53.2	59 53.6	7.4622	8.217	2.40	3.23
4 19 29.8	156	0 23 34.39	23 34.45	1 0 16.6	0 17.0	7.4506	8.204	2.41	3.23
5 19 26.0	157	0 23 38.40	23 38.46	1 0 39.2	0 39.6	7.4387	8.190	2.41	3.24
6 19 22.1	158	0 23 42.30	23 42.36	1 1 1.1	1 1.5	7.4259	8.176	2.42	3.24
7 19 18.3	159	0 23 46.09	23 46.15	1 1 22.3	1 22.7	7.4151	8.161	2.42	3.24
8 19 14.4	160	0 23 49.78	23 49.84	1 1 42.8	1 43.2	7.4021	8.145	2.42	3.24
9 19 10.5	161	0 23 53.36	23 53.42	1 2 2.6	2 3.0	7.3887	8.129	2.43	3.25
10 19 6.6	162	0 23 56.83	23 56.88	1 2 21.6	2 21.9	7.3750	8.112	2.43	3.25
11 19 2.8	163	0 24 0.19	24 0.24	1 2 39.9	2 40.2	7.3614	8.094	2.43	3.25
12 18 58.9	164	0 24 3.44	24 3.49	1 2 57.4	2 57.7	7.3454	8.076	2.44	3.25
13 18 55.0	165	0 24 6.57	24 6.62	1 3 14.2	3 14.5	7.3294	8.057	2.44	3.26
14 18 51.1	166	0 24 9.59	24 9.64	1 3 30.3	3 30.6	7.3144	8.037	2.44	3.26
15 18 47.2	167	0 24 12.50	24 12.54	1 3 45.6	3 45.9	7.2964	8.015	2.44	3.26
16 18 43.3	168	0 24 15.29	24 15.33	1 4 0.1	4 0.4	7.2794	7.992	2.44	3.26
17 18 39.4	169	0 24 17.97	24 18.01	1 4 13.9	4 14.2	7.2599	7.968	2.45	3.26
18 18 35.5	170	0 24 20.53	24 20.57	1 4 26.9	4 27.1	7.2395	7.942	2.45	3.26
19 18 31.7	171	0 24 22.97	24 23.01	1 4 39.1	4 39.3	7.2190	7.915	2.45	3.26
20 18 27.8	172	0 24 25.30	24 25.33	1 4 50.6	4 50.8	7.1976	7.887	2.45	3.26
21 18 23.9	173	0 24 27.51	24 27.54	1 5 1.3	5 1.5	7.1740	7.856	2.45	3.26
22 18 20.0	174	0 24 29.60	24 29.63	1 5 11.3	5 11.5	7.1491	7.824	2.45	3.26
23 18 16.1	175	0 24 31.57	24 31.60	1 5 20.5	5 20.7	7.1249	7.786	2.45	3.26
24 18 12.2	176	0 24 33.43	24 33.46	1 5 28.9	5 29.1	7.0969	7.747	2.45	3.27
25 18 8.3	177	0 24 35.17	24 35.20	1 5 36.6	5 36.8	7.0669	7.705	2.45	3.27
26 18 4.4	178	0 24 36.79	24 36.81	1 5 43.5	5 43.6	7.0347	7.654	2.45	3.27
27 18 0.5	179	0 24 38.29	24 38.31	1 5 49.6	5 49.7	7.0000	7.597	2.45	3.27
28 17 56.6	180	0 24 39.67	24 39.69	1 5 54.9	5 55.0	6.9655	7.536	2.45	3.27
29 17 52.7	181	0 24 40.94	24 40.96	1 5 59.5	5 59.6	6.9244	7.465	2.45	3.27
30 17 48.8	182	0 24 42.09	24 42.10	1 6 3.3	6 3.4	6.8790	7.373	2.45	3.27
31 17 44.9	183	0 24 43.12	24 43.13	+ 1 6 6.3	6 6.4	+6.8284	+7.265	-2.45	-3.27

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
July	d h m	d h m s	m s	+ ° ' "	' "				
1 17 44.9	183	0 24 43.12	24 43.13	1 6 6.3	6 6.4	+6.8284	+7.265	-2.45	-3.27
2 17 41.0	184	0 24 44.03	24 44.04	1 6 8.6	6 8.7	6.7710	7.120	2.45	3.27
3 17 37.1	185	0 24 44.82	24 44.83	1 6 10.1	6 10.2	6.7049	6.883	2.46	3.27
4 17 33.1	186	0 24 45.50	24 45.50	1 6 10.8	6 10.8	6.6269	+6.319	2.46	3.27
5 17 29.2	187	0 24 46.06	24 46.06	1 6 10.7	6 10.7	6.5318	-6.495	2.46	3.27
6 17 25.3	188	0 24 46.50	24 46.50	1 6 9.9	6 9.9	6.4098	6.921	2.46	3.27
7 17 21.4	189	0 24 46.81	24 46.81	1 6 8.3	6 8.3	6.2395	7.132	2.46	3.26
8 17 17.4	190	0 24 47.00	24 47.00	1 6 6.0	6 6.0	5.9555	7.273	2.46	3.26
9 17 13.5	191	0 24 47.07	24 47.07	1 6 2.9	6 2.9	+4.8416	7.386	2.46	3.26
10 17 9.5	192	0 24 47.02	24 47.02	1 5 59.0	5 59.0	-5.8830	7.470	2.46	3.26
11 17 5.6	193	0 24 46.86	24 46.86	1 5 54.4	5 54.4	6.2033	7.540	2.46	3.26
12 17 1.6	194	0 24 46.58	24 46.57	1 5 49.0	5 48.9	6.3857	7.605	2.46	3.26
13 16 57.7	195	0 24 46.18	24 46.17	1 5 42.8	5 42.7	6.5137	7.658	2.46	3.26
14 16 53.8	196	0 24 45.66	24 45.65	1 5 35.9	5 35.8	6.6125	7.705	2.46	3.26
15 16 49.9	197	0 24 45.02	24 45.01	1 5 28.2	5 28.1	6.6959	7.747	2.45	3.25
16 16 45.9	198	0 24 44.25	24 44.23	1 5 19.8	5 19.7	6.7581	7.786	2.45	3.25
17 16 42.0	199	0 24 43.37	24 43.35	1 5 10.6	5 10.5	6.8101	7.822	2.45	3.25
18 16 38.0	200	0 24 42.38	24 42.36	1 5 0.7	5 0.6	6.8628	7.853	2.45	3.25
19 16 34.1	201	0 24 41.27	24 41.25	1 4 50.1	4 50.0	6.9098	7.883	2.45	3.24
20 16 30.1	202	0 24 40.04	24 40.01	1 4 38.7	4 38.5	6.9539	7.912	2.45	3.24
21 16 26.2	203	0 24 38.69	24 38.66	1 4 26.6	4 26.4	6.9992	7.937	2.45	3.24
22 16 22.2	204	0 24 37.23	24 37.20	1 4 13.8	4 13.6	7.0206	7.962	2.45	3.24
23 16 18.3	205	0 24 35.66	24 35.63	1 4 0.2	4 0.0	7.0551	7.986	2.44	3.23
24 16 14.3	206	0 24 33.97	24 33.94	1 3 45.9	3 45.7	7.0833	8.007	2.44	3.23
25 16 10.3	207	0 24 32.17	24 32.14	1 3 30.9	3 30.7	7.1100	8.028	2.44	3.23
26 16 6.4	208	0 24 30.26	24 30.23	1 3 15.2	3 15.0	7.1339	8.047	2.44	3.23
27 16 2.4	209	0 24 28.24	24 28.21	1 2 58.8	2 58.6	7.1608	8.066	2.43	3.22
28 15 58.4	210	0 24 26.10	24 26.06	1 2 41.7	2 41.4	7.1840	8.083	2.43	3.22
29 15 54.4	211	0 24 23.85	24 23.81	1 2 23.9	2 23.6	7.2044	8.099	2.43	3.22
30 15 50.5	212	0 24 21.50	24 21.46	1 2 5.5	2 5.2	7.2226	8.115	2.42	3.21
Aug. 1 15 46.5	213	0 24 19.04	24 19.00	1 1 46.4	1 46.1	7.2404	8.131	2.42	3.21
2 15 42.5	214	0 24 16.48	24 16.44	1 1 26.6	1 26.3	7.2599	8.146	2.41	3.20
3 15 38.5	215	0 24 13.81	24 13.77	1 1 6.1	1 5.8	7.2769	8.160	2.41	3.20
4 15 34.6	216	0 24 11.04	24 11.00	1 0 45.0	0 44.7	7.2934	8.173	2.40	3.19
5 15 30.6	217	0 24 8.16	24 8.12	1 0 23.3	0 23.0	7.3085	8.186	2.40	3.19
6 15 26.6	218	0 24 5.18	24 5.13	1 0 0.9	0 0.5	7.3230	8.198	2.39	3.18
7 15 22.6	219	0 24 2.10	24 2.05	0 59 37.9	59 37.5	7.3371	8.210	2.39	3.18
8 15 18.6	220	0 23 58.92	23 58.87	0 59 14.3	59 13.9	7.3521	8.221	2.38	3.17
9 15 14.6	221	0 23 55.63	23 55.58	0 58 50.0	58 49.6	7.3653	8.232	2.38	3.17
10 15 10.6	222	0 23 52.24	23 52.19	0 58 25.1	58 24.7	7.3775	8.243	2.37	3.16
11 15 6.6	223	0 23 48.76	23 48.71	0 57 59.6	57 59.2	7.3894	8.253	2.37	3.16
12 15 2.6	224	0 23 45.18	23 45.13	0 57 33.5	57 33.1	7.4015	8.263	2.36	3.15
13 14 58.6	225	0 23 41.50	23 41.45	0 57 6.9	57 6.5	7.4127	8.272	2.35	3.14
14 14 54.6	226	0 23 37.73	23 37.67	0 56 39.7	56 39.2	7.4231	8.281	2.34	3.13
15 14 50.6	227	0 23 33.87	23 33.81	0 56 11.9	56 11.4	7.4332	8.290	2.34	3.12
16 14 46.6	228	0 23 29.92	23 29.86	0 55 43.6	55 43.1	7.4431	8.298	2.33	3.11
17 14 42.6	229	0 23 25.88	23 25.82	0 55 14.8	55 14.3	7.4528	8.306	2.32	3.10
18 14 38.6	230	0 23 21.75	23 21.69	0 54 45.4	54 44.9	7.4622	8.314	2.31	3.09
19 14 34.6	231	0 23 17.53	23 17.47	0 54 15.5	54 15.0	7.4710	8.321	2.31	3.08
20 14 30.6	232	0 23 13.23	23 13.17	0 53 45.1	53 44.6	7.4791	8.328	2.30	3.07
21 14 26.6	233	0 23 8.85	23 8.79	0 53 14.2	53 13.7	7.4870	8.335	2.29	3.06
22 14 22.6	234	0 23 4.38	23 4.31	0 52 42.9	52 42.4	7.4948	8.341	2.28	3.05
23 14 18.6	235	0 22 59.84	22 59.77	0 52 11.1	52 10.6	7.5025	8.347	2.28	3.04
24 14 14.6	236	0 22 55.22	22 55.15	0 51 38.8	51 38.3	7.5100	8.353	2.27	3.03
25 14 10.6	237	0 22 50.53	22 50.46	0 51 6.1	51 5.6	7.5174	8.359	2.26	3.02
26 14 6.6	238	0 22 45.75	22 45.68	0 50 32.9	50 32.4	7.5241	8.365	2.25	3.00
27 14 2.6	239	0 22 40.90	22 40.83	0 49 59.3	49 58.8	7.5304	8.370	2.24	2.99
28 13 58.6	240	0 22 35.98	22 35.91	0 49 25.3	49 24.8	7.5362	8.375	2.23	2.98
29 13 54.5	241	0 22 31.00	22 30.93	0 48 50.9	48 50.4	7.5418	8.380	2.22	2.97
30 13 50.5	242	0 22 25.95	22 25.87	0 48 16.1	48 15.5	7.5479	8.385	2.20	2.95
31 13 46.5	243	0 22 20.83	22 20.75	0 47 41.0	47 40.4	7.5534	8.390	2.19	2.94
31 13 42.5	244	0 22 15.65	22 15.57	+ 0 47 5.5	47 4.9	-7.5584	-8.394	-2.18	-2.93

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Sept. 1 13 38.5	245	0 22 10.41	22 10.33	+ 0 46 29.6	46 29.0	-7.5634	-8.398	-2.17	-2.91
2 13 34.4	246	0 22 5.10	22 5.02	0 45 53.4	45 52.8	7.5683	8.402	2.15	2.89
3 13 30.4	247	0 21 59.74	21 59.66	0 45 16.9	45 16.3	7.5732	8.406	2.14	2.88
4 13 26.4	248	0 21 54.32	21 54.24	0 44 40.0	44 39.4	7.5776	8.410	2.12	2.86
5 13 22.4	249	0 21 48.85	21 48.77	0 44 2.8	44 2.2	7.5820	8.414	2.10	2.84
6 13 18.3	250	0 21 43.32	21 43.24	0 43 25.3	43 24.7	7.5863	8.417	2.08	2.82
7 13 14.3	251	0 21 37.74	21 37.66	0 42 47.6	42 47.0	7.5898	8.420	2.06	2.80
8 13 10.3	252	0 21 32.12	21 32.04	0 42 9.6	42 9.0	7.5933	8.423	2.04	2.77
9 13 6.3	253	0 21 26.45	21 26.37	0 41 31.4	41 30.8	7.5967	8.426	2.02	2.74
10 13 2.2	254	0 21 20.74	21 20.66	0 40 53.0	40 52.4	7.5998	8.428	2.00	2.70
11 12 58.2	255	0 21 14.99	21 14.91	0 40 14.4	40 13.8	7.6028	8.430	1.97	-2.65
12 12 54.2	256	0 21 9.20	21 9.12	0 39 35.6	39 35.0	7.6058	8.432	1.94	
13 12 50.2	257	0 21 3.37	21 3.29	0 38 56.6	38 56.0	7.6088	8.434	1.91	
14 12 46.1	258	0 20 57.50	20 57.42	0 38 17.3	38 16.7	7.6114	8.436	1.88	
15 12 42.1	259	0 20 51.60	20 51.52	0 37 37.9	37 37.3	7.6136	8.438	1.85	
16 12 38.1	260	0 20 45.67	20 45.59	0 36 58.4	36 57.8	7.6154	8.439	1.81	
17 12 34.1	261	0 20 39.72	20 39.64	0 36 18.8	36 18.2	7.6168	8.440	1.77	
18 12 30.0	262	0 20 33.75	20 33.67	0 35 39.1	35 38.5	7.6187	8.441	1.73	
19 12 26.0	263	0 20 27.75	20 27.67	0 34 59.3	34 58.7	7.6205	8.442	-1.67	
20 12 22.0	264	0 20 21.73	20 21.65	0 34 19.4	34 18.8	7.6219	8.443		
21 12 18.0	265	0 20 15.69	20 15.61	0 33 39.5	33 38.9	7.6230	8.443		
22 12 13.9	266	0 20 9.64	20 9.56	0 32 59.5	32 59.0	7.6241	8.444		
23 12 9.9	267	0 20 3.57	20 3.49	0 32 19.4	32 18.9	7.6250	8.444		
24 12 5.9	268	0 19 57.49	19 57.41	0 31 39.4	31 38.9	7.6259	8.444		
25 12 1.8	269	0 19 51.40	19 51.32	0 30 59.4	30 48.9	7.6262	8.444		
26 11 57.8	270	0 19 45.31	19 45.23	0 30 19.4	30 18.9	7.6266	8.444		
27 11 53.8	271	0 19 39.21	19 39.13	0 29 39.4	29 38.9	7.6269	8.443		
28 11 49.7	272	0 19 33.11	19 33.03	0 28 59.5	28 59.0	7.6269	8.443		
29 11 45.7	273	0 19 27.01	19 26.93	0 28 19.6	28 19.1	7.6269	8.442		
30 11 41.6	274	0 19 20.91	19 20.83	0 27 39.8	27 39.3	7.6266	8.441		
Oct. 1 11 37.6	275	0 19 14.82	19 14.74	0 27 0.1	26 59.6	7.6262	8.440		
2 11 33.6	276	0 19 8.73	19 8.65	0 26 20.5	26 20.0	7.6257	8.439		
3 11 29.5	277	0 19 2.65	19 2.57	0 25 41.0	25 40.5	7.6248	8.438		
4 11 25.5	278	0 18 56.59	18 56.51	0 25 1.7	25 1.2	7.6238	8.436		
5 11 21.5	279	0 18 50.54	18 50.46	0 24 22.5	24 22.0	7.6228	8.434		
6 11 17.4	280	0 18 44.51	18 44.43	0 23 43.5	23 43.0	7.6216	8.432	+1.65	
7 11 13.4	281	0 18 38.49	18 38.41	0 23 4.7	23 4.2	7.6199	8.430	1.71	+2.65
8 11 9.3	282	0 18 32.49	18 32.41	0 22 26.0	22 25.5	7.6183	8.428	1.76	2.71
9 11 5.3	283	0 18 26.52	18 26.44	0 21 47.5	21 47.0	7.6168	8.425	1.80	2.75
10 11 1.3	284	0 18 20.57	18 20.49	0 21 9.3	21 8.8	7.6151	8.422	1.84	2.78
11 10 57.2	285	0 18 14.65	18 14.57	0 20 31.4	20 30.9	7.6125	8.419	1.88	2.81
12 10 53.2	286	0 18 8.77	18 8.69	0 19 53.7	19 53.2	7.6099	8.416	1.91	2.83
13 10 49.2	287	0 18 2.92	18 2.84	0 19 16.3	19 15.8	7.6073	8.413	1.94	2.85
14 10 45.2	288	0 17 57.11	17 57.04	0 18 39.2	18 38.7	7.6047	8.410	1.97	2.87
15 10 41.1	289	0 17 51.33	17 51.25	0 18 2.4	18 1.9	7.6020	8.406	2.00	2.89
16 10 37.1	290	0 17 45.59	17 45.52	0 17 25.9	17 25.5	7.5996	8.402	2.02	2.91
17 10 33.1	291	0 17 39.90	17 39.83	0 16 49.7	16 49.3	7.5948	8.398	2.05	2.93
18 10 29.1	292	0 17 34.26	17 34.19	0 16 13.9	16 13.5	7.5913	8.394	2.07	2.95
19 10 25.0	293	0 17 28.66	17 28.59	0 15 38.5	15 38.1	7.5879	8.389	2.09	2.97
20 10 21.0	294	0 17 23.11	17 23.04	0 15 3.5	15 3.1	7.5835	8.384	2.11	2.98
21 10 17.0	295	0 17 17.62	17 17.55	0 14 28.9	14 28.5	7.5192	8.379	2.13	3.00
22 10 13.0	296	0 17 12.18	17 12.11	0 13 54.7	13 54.3	7.5748	8.374	2.15	3.01
23 10 8.9	297	0 17 6.80	17 6.73	0 13 20.9	13 20.5	7.5700	8.368	2.16	3.02
24 10 4.9	298	0 17 1.48	17 1.42	0 12 47.4	12 47.0	7.5651	8.362	2.17	3.03
25 10 0.9	299	0 16 56.22	16 56.16	0 12 14.4	12 14.0	7.5601	8.356	2.19	3.05
26 9 56.9	300	0 16 51.02	16 50.96	0 11 41.9	11 41.5	7.5546	8.350	2.20	3.06
27 9 52.9	301	0 16 45.89	16 45.83	0 11 9.9	11 9.5	7.5492	8.343	2.21	3.07
28 9 48.8	302	0 16 40.82	16 40.76	0 10 38.4	10 38.0	7.5436	8.336	2.22	3.08
29 9 44.8	303	0 16 35.82	16 35.76	0 10 7.4	10 7.0	7.5375	8.329	2.24	3.09
30 9 40.8	304	0 16 30.89	16 30.83	0 9 36.9	9 36.5	7.5309	8.322	2.25	3.10
31 9 36.8	305	0 16 26.04	16 25.98	0 9 6.9	9 6.5	7.5241	8.315	2.26	3.11
32 9 32.8	306	0 16 21.26	16 21.21	+ 0 8 37.4	8 37.1	-7.5174	-8.307	+2.27	+3.12

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Nov. 1 9 32.8	306	0 16 21.26	16 21.21	+ 0 8 37.4	8 37.1	-7.5174	-8.307	+2.27	+3.12
2 9 28.8	307	0 16 16.56	16 16.51	0 8 8.5	8 8.2	7.5100	8.299	2.28	3.13
3 9 24.7	308	0 16 11.94	16 11.89	0 7 40.1	7 39.8	7.5025	8.291	2.29	3.14
4 9 20.7	309	0 16 7.40	16 7.35	0 7 12.3	7 12.0	7.4948	8.282	2.30	3.16
5 9 16.7	310	0 16 2.93	16 2.88	0 6 45.1	6 44.8	7.4870	8.273	2.31	3.16
6 9 12.7	311	0 15 58.55	15 58.50	0 6 18.5	6 18.2	7.4796	8.263	2.32	3.17
7 9 8.7	312	0 15 54.26	15 54.21	0 5 52.5	5 52.2	7.4695	8.252	2.33	3.18
8 9 4.7	313	0 15 50.06	15 50.01	0 5 27.1	5 26.8	7.4601	8.241	2.34	3.19
9 9 0.7	314	0 15 45.94	15 45.90	0 5 2.4	5 2.2	7.4506	8.229	2.34	3.19
10 8 56.7	315	0 15 41.92	15 41.88	0 4 38.3	4 38.1	7.4409	8.217	2.35	3.20
11 8 52.7	316	0 15 37.99	15 37.95	0 4 14.9	4 14.7	7.4304	8.205	2.36	3.20
12 8 48.7	317	0 15 34.16	15 34.12	0 3 52.1	3 51.9	7.4191	8.192	2.37	3.21
13 8 44.7	318	0 15 30.43	15 30.39	0 3 30.0	3 29.8	7.4074	8.179	2.37	3.21
14 8 40.8	319	0 15 26.80	15 26.76	0 3 8.6	3 8.4	7.3955	8.165	2.38	3.22
15 8 36.8	320	0 15 23.27	15 23.23	0 2 47.9	2 47.6	7.3832	8.151	2.39	3.22
16 8 32.8	321	0 15 19.84	15 19.80	0 2 27.9	2 27.7	7.3705	8.136	2.40	3.23
17 8 28.8	322	0 15 16.50	15 16.47	0 2 8.5	2 8.3	7.3575	8.120	2.40	3.23
18 8 24.8	323	0 15 13.27	15 13.24	0 1 49.9	1 49.7	7.3434	8.103	2.40	3.24
19 8 20.9	324	0 15 10.15	15 10.12	0 1 32.0	1 31.8	7.3280	8.086	2.41	3.24
20 8 16.9	325	0 15 7.14	15 7.11	0 1 14.8	1 14.6	7.3121	8.068	2.41	3.25
21 8 12.9	326	0 15 4.24	15 4.21	0 0 58.3	0 58.1	7.2957	8.048	2.42	3.25
22 8 8.9	327	0 15 1.45	15 1.42	0 0 42.6	0 42.4	7.2786	8.028	2.42	3.26
23 8 5.0	328	0 14 58.77	14 58.74	0 0 27.6	0 27.4	7.2607	8.006	2.43	3.26
24 8 1.0	329	0 14 56.20	14 56.17	+ 0 0 13.4	0 13.2	7.2422	7.983	2.43	3.27
25 7 57.0	330	0 14 53.73	14 53.71	- 0 0 0.1	0 0.2	7.2227	7.959	2.44	3.27
26 7 53.0	331	0 14 51.38	14 51.36	0 0 12.8	0 12.9	7.2014	7.932	2.44	3.27
27 7 49.1	332	0 14 49.15	14 49.13	0 0 24.7	0 24.8	7.1791	7.904	2.44	3.28
28 7 45.1	333	0 14 47.03	14 47.01	0 0 35.9	0 36.0	7.1555	7.875	2.45	3.28
29 7 41.1	334	0 14 45.03	14 45.01	0 0 46.3	0 46.4	7.1294	7.842	2.45	3.28
30 7 37.1	335	0 14 43.15	14 43.13	0 0 55.9	0 56.0	7.1017	7.805	2.45	3.28
Dec. 1 7 33.2	336	0 14 41.39	14 41.37	0 1 4.7	1 4.8	7.0720	7.766	2.45	3.29
2 7 29.2	337	0 14 39.75	14 39.73	0 1 12.7	1 12.8	7.0403	7.722	2.46	3.29
3 7 25.3	338	0 14 38.22	14 38.21	0 1 19.9	1 20.0	7.0060	7.674	2.46	3.29
4 7 21.3	339	0 14 36.82	14 36.81	0 1 26.3	1 26.3	6.9687	7.620	2.46	3.29
5 7 17.4	340	0 14 35.54	14 35.53	0 1 31.9	1 31.9	6.9280	7.553	2.46	3.29
6 7 13.4	341	0 14 34.38	14 34.37	0 1 36.6	1 36.6	6.8830	7.475	2.47	3.30
7 7 9.5	342	0 14 33.34	14 33.33	0 1 40.5	1 40.5	6.8328	7.386	2.47	3.30
8 7 5.5	343	0 14 32.42	14 32.41	0 1 43.6	1 43.6	6.7736	7.273	2.47	3.30
9 7 1.6	344	0 14 31.63	14 31.62	0 1 45.9	1 45.9	6.7019	7.109	2.47	3.30
10 6 57.7	345	0 14 30.97	14 30.96	0 1 47.3	1 47.3	6.6161	6.842	2.48	3.30
11 6 53.8	346	0 14 30.44	14 30.44	0 1 47.9	1 47.9	6.5137	-6.143	2.48	3.30
12 6 49.8	347	0 14 30.03	14 30.03	0 1 47.7	1 47.7	6.3794	+6.655	2.48	3.30
13 6 45.9	348	0 14 29.75	14 29.75	0 1 46.6	1 46.6	6.1740	7.018	2.48	3.30
14 6 41.9	349	0 14 29.60	14 29.60	0 1 44.7	1 44.7	-5.7958	7.203	2.49	3.30
15 6 38.0	350	0 14 29.57	14 29.57	0 1 42.0	1 42.0	+5.3857	7.340	2.49	3.30
16 6 34.0	351	0 14 29.67	14 29.67	0 1 38.4	1 38.4	5.9023	7.444	2.49	3.30
17 6 30.1	352	0 14 29.90	14 29.90	0 1 34.0	1 34.0	6.3114	7.523	2.49	3.30
18 6 26.2	353	0 14 30.26	14 30.26	0 1 28.8	1 28.8	6.4648	7.590	2.49	3.30
19 6 22.3	354	0 14 30.74	14 30.75	0 1 22.8	1 22.9	6.5780	7.651	2.49	3.30
20 6 18.3	355	0 14 31.35	14 31.36	0 1 15.9	1 16.0	6.6709	7.705	2.49	3.30
21 6 14.4	356	0 14 32.09	14 32.10	0 1 8.2	1 8.3	6.7474	7.750	2.49	3.30
22 6 10.5	357	0 14 32.96	14 32.97	0 0 59.7	0 59.8	6.8101	7.791	2.48	3.30
23 6 6.6	358	0 14 33.95	14 33.96	0 0 50.4	0 50.5	6.8649	7.831	2.48	3.30
24 6 2.7	359	0 14 35.07	14 35.08	0 0 40.2	0 40.3	6.9135	7.867	2.48	3.30
25 5 58.8	360	0 14 36.31	14 36.32	0 0 29.2	0 29.3	6.9571	7.898	2.48	3.30
26 5 54.9	361	0 14 37.68	14 37.69	0 0 17.4	0 17.5	6.9969	7.928	2.47	3.30
27 5 51.0	362	0 14 39.17	14 39.19	- 0 0 4.8	0 4.9	7.0319	7.957	2.47	3.30
28 5 47.1	363	0 14 40.78	14 40.80	+ 0 0 8.7	0 8.5	7.0656	7.985	2.47	3.29
29 5 43.2	364	0 14 42.52	14 42.54	0 0 23.0	0 22.8	7.0969	8.009	2.47	3.29
30 5 39.3	365	0 14 44.38	14 44.40	0 0 38.1	0 37.9	7.1249	8.032	2.46	3.29
31 5 35.4	366	0 14 46.36	14 46.38	0 0 54.0	0 53.8	7.1512	8.055	2.46	3.29
32 5 31.5	367	0 14 48.46	14 48.48	+ 0 1 10.8	1 10.6	+7.1761	+8.077	+2.46	+3.29

HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

Sidereal Date.	HORIZONTAL PARALLAXES.			VERTICAL SEMIDIAMETER.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	♂	♀	♂	♂	♀	♂	♂	♀	♂
1	6.14	5.04	9.03	2.39	5.02	5.34	0.18	0.36	0.36
6	6.36	5.06	8.57	2.48	5.04	5.06	0.18	0.36	0.35
11	6.71	5.07	8.18	2.61	5.04	4.82	0.19	0.36	0.34
16	7.23	5.09	7.83	2.81	5.07	4.61	0.20	0.36	0.32
21	8.00	5.12	7.51	3.12	5.10	4.42	0.21	0.36	0.31
26	9.15	5.14	7.22	3.56	5.12	4.24	0.24	0.36	0.30
31	10.69	5.17	6.92	4.16	5.15	4.08	0.28	0.36	0.29
36	12.30	5.21	6.66	4.79	5.19	3.92	0.32	0.36	0.27
41	13.25	5.24	6.41	5.16	5.22	3.78	0.36	0.36	0.26
46	13.10	5.28	6.19	5.10	5.26	3.64	0.35	0.36	0.25
51	12.21	5.33	5.98	4.75	5.31	3.52	0.33	0.36	0.25
56	11.12	5.37	5.79	4.33	5.36	3.41	0.31	0.36	0.24
61	10.13	5.43	5.60	3.94	5.41	3.30	0.29	0.36	0.24
66	9.20	5.49	5.43	3.61	5.47	3.20	0.26	0.36	0.23
71	8.61	5.56	5.27	3.35	5.53	3.10	0.23	0.37	0.23
76	8.06	5.61	5.13	3.13	5.60	3.02	0.21	0.38	0.22
81	7.60	5.70	4.99	2.96	5.68	2.94	0.20	0.38	0.22
86	7.22	5.79	4.85	2.81	5.78	2.86	0.19	0.39	0.21
91	6.91	5.88	4.72	2.69	5.86	2.79	0.18	0.40	0.21
96	6.67	6.00	4.60	2.60	5.98	2.71	0.18	0.42	0.20
101	6.51	6.09	4.40	2.53	6.06	2.64	0.17	0.43	0.19
106	6.43	6.20	4.38	2.50	6.18	2.58	0.17	0.44	0.19
111	6.47	6.34	4.29	2.52	6.32	2.53	0.18	0.45	0.19
116	6.68	6.48	4.20	2.61	6.46	2.48	0.19	0.47	0.18
121	7.10	6.62	4.12	2.77	6.60	2.43	0.20	0.48	0.18
126	7.73	6.79	4.05	3.01	6.76	2.39	0.22	0.50	0.18
131	8.59	6.96	3.97	3.34	6.94	2.34	0.24	0.51	0.17
136	9.64	7.16	3.91	3.76	7.13	2.30	0.27	0.53	0.17
141	10.89	7.37	3.86	4.24	7.34	2.26	0.31	0.54	0.17
146	12.24	7.60	3.80	4.76	7.57	2.24	0.35	0.56	0.16
151	13.61	7.85	3.74	5.30	7.82	2.20	0.39	0.57	0.16
156	14.79	8.13	3.69	5.76	8.10	2.17	0.42	0.59	0.16
161	15.47	8.43	3.64	6.02	8.40	2.14	0.43	0.60	0.15
166	15.43	8.76	3.59	6.01	8.73	2.12	0.41	0.62	0.15
171	14.66	9.13	3.55	5.71	9.09	2.09	0.39	0.64	0.15
176	13.40	9.53	3.51	5.22	9.49	2.07	0.37	0.66	0.15
181	11.95	9.96	3.48	4.65	9.92	2.05	0.35	0.69	0.15
186	10.54	10.45	3.45	4.10	10.41	2.04	0.32	0.71	0.14
191	9.29	10.99	3.42	3.61	10.95	2.02	0.28	0.78	0.14
196	8.24	11.58	3.39	3.21	11.53	2.00	0.24	0.78	0.14
201	7.42	12.25	3.37	2.89	12.21	1.99	0.21	0.82	0.14
206	6.85	12.99	3.35	2.67	12.94	1.97	0.19	0.87	0.14
211	6.52	13.84	3.32	2.54	13.78	1.96	0.18	0.92	0.13
216	6.37	14.75	3.30	2.48	14.68	1.95	0.18	0.98	0.13
221	6.35	15.83	3.29	2.47	15.76	1.94	0.17	1.06	0.13
226	6.43	17.04	3.28	2.50	17.00	1.94	0.17	1.14	0.13
231	6.59	18.37	3.27	2.56	18.28	1.93	0.18	1.23	0.13
236	6.81	19.86	3.27	2.65	19.79	1.92	0.18	1.34	0.13
241	7.09	21.54	3.26	2.76	21.46	1.92	0.19	1.46	0.13
246	7.45	23.35	3.25	2.90	23.26	1.92	0.20	1.59	0.13
251	7.90	25.24	3.25	3.08	25.15	1.91	0.21	1.72	0.13
256	8.46	27.11	3.24	3.29	27.03	1.91	0.23	1.85	0.13
261	9.16	28.80	3.24	3.56	28.68	1.91	0.25	1.96	0.13
266	10.02	30.03	3.25	3.90	29.94	1.91	0.27	2.04	0.13
271	11.07	30.69	3.25	4.31	30.58	1.92	0.30	2.08	0.13
276	12.17	30.52	3.26	4.74	30.41	1.92	0.32	2.06	0.13
281	12.92	29.60	3.26	5.03	29.48	1.92	0.34	1.99	0.13
286	12.70	28.21	3.27	4.94	28.11	1.93	0.32	1.89	0.13
291	11.41	26.46	3.29	4.44	26.36	1.94	0.29	1.77	0.13
296	9.81	24.59	3.30	3.82	24.50	1.95	0.25	1.64	0.13

HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

♄ Sideral Date.	HORIZONTAL PARALLAXES.			VERTICAL SEMIDIAMETER.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	♂	♀	♂	♂	♀	♂	♂	♀	♂
^d									
301	8.48	22.76	3.32	3.30	22.69	1.95	0.22	1.52	0.13
306	7.54	21.08	3.34	2.93	21.00	1.97	0.20	1.40	0.13
311	6.92	19.47	3.36	2.69	19.39	1.98	0.19	1.30	0.13
316	6.50	18.06	3.38	2.53	17.99	1.99	0.18	1.21	0.13
321	6.22	16.81	3.40	2.42	16.75	2.00	0.18	1.12	0.13
326	6.05	15.70	3.43	2.35	15.64	2.01	0.17	1.05	0.14
331	5.95	14.68	3.46	2.31	14.63	2.04	0.17	0.98	0.14
336	5.91	13.80	3.49	2.30	13.75	2.05	0.17	0.93	0.14
341	5.93	13.01	3.52	2.31	12.99	2.07	0.17	0.88	0.14
346	6.02	12.32	3.56	2.34	12.27	2.09	0.18	0.83	0.15
351	6.17	11.69	3.60	2.40	11.65	2.11	0.18	0.80	0.15
356	6.40	11.12	3.64	2.49	11.08	2.13	0.18	0.76	0.15
361	6.76	10.60	3.68	2.63	10.56	2.16	0.19	0.73	0.15
366	7.27	10.13	3.73	2.83	10.09	2.19	0.20	0.70	0.16
♄ Sideral Date.	♂	♀	♂	♂	♀	♂	♂	♀	♂
^d									
1	1.53	0.91	0.47	17.16	8.35	1.84	1.20	0.56	0.12
11	1.57	0.92	0.47	17.66	8.50	1.83	1.23	0.57	0.12
21	1.62	0.94	0.47	18.20	8.65	1.82	1.27	0.58	0.12
31	1.67	0.96	0.46	18.76	8.80	1.80	1.31	0.59	0.12
41	1.72	0.98	0.46	19.34	8.93	1.79	1.35	0.60	0.12
51	1.77	0.99	0.46	19.90	9.04	1.78	1.39	0.60	0.12
61	1.82	1.00	0.45	20.42	9.11	1.77	1.43	0.61	0.12
71	1.86	1.00	0.45	20.88	9.16	1.76	1.46	0.61	0.12
81	1.90	1.00	0.45	21.26	9.17	1.74	1.48	0.61	0.12
91	1.92	1.00	0.44	21.50	9.14	1.73	1.50	0.61	0.11
101	1.93	1.00	0.44	21.61	9.09	1.72	1.51	0.61	0.11
111	1.93	0.99	0.44	21.58	9.02	1.71	1.50	0.61	0.11
121	1.91	0.98	0.44	21.40	8.92	1.70	1.49	0.60	0.11
131	1.88	0.97	0.43	21.09	8.80	1.69	1.47	0.59	0.11
141	1.84	0.95	0.43	20.68	8.66	1.68	1.44	0.58	0.11
151	1.80	0.94	0.43	20.19	8.52	1.67	1.40	0.57	0.11
161	1.75	0.92	0.43	19.66	8.37	1.67	1.37	0.56	0.11
171	1.70	0.91	0.43	19.11	8.23	1.67	1.33	0.55	0.11
181	1.66	0.89	0.43	18.57	8.10	1.67	1.29	0.54	0.11
191	1.61	0.88	0.43	18.03	7.97	1.68	1.25	0.53	0.11
201	1.56	0.86	0.44	17.52	7.85	1.68	1.22	0.53	0.11
211	1.52	0.85	0.44	17.06	7.74	1.69	1.19	0.52	0.11
221	1.48	0.84	0.44	16.64	7.64	1.70	1.16	0.51	0.11
231	1.45	0.83	0.44	16.26	7.55	1.71	1.13	0.51	0.12
241	1.42	0.82	0.45	15.93	7.48	1.73	1.11	0.50	0.12
251	1.39	0.82	0.45	15.64	7.44	1.74	1.09	0.50	0.12
261	1.37	0.81	0.45	15.41	7.41	1.76	1.08	0.50	0.12
271	1.36	0.81	0.45	15.22	7.39	1.77	1.07	0.49	0.12
281	1.35	0.81	0.46	15.09	7.39	1.79	1.06	0.49	0.12
291	1.34	0.81	0.46	15.01	7.41	1.80	1.06	0.50	0.12
301	1.34	0.81	0.46	14.97	7.44	1.82	1.06	0.50	0.12
311	1.34	0.82	0.46	14.99	7.50	1.83	1.07	0.50	0.12
321	1.34	0.83	0.47	15.06	7.57	1.84	1.08	0.50	0.12
331	1.35	0.84	0.47	15.17	7.66	1.84	1.09	0.51	0.12
341	1.37	0.85	0.47	15.35	7.77	1.85	1.10	0.52	0.12
351	1.39	0.86	0.47	15.58	7.89	1.85	1.12	0.53	0.12
361	1.42	0.88	0.47	15.84	8.01	1.85	1.15	0.53	0.12
371	1.44	0.89	0.47	16.18	8.12	1.85	1.17	0.54	0.12

NOTE. — For Neptune the Horizontal Parallax = 0".28 (before 165d.)
 " " " " = 0".29 (between 165d. and 229d. and after 308d.)
 " " " " = 0".30 (between 229d. and 308d.)

380. SUN'S COÖRDINATES, 1863.

Date, 1863.		RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
		X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = r .	
Jan.	1.0	+1854243	3429	-8858053	8141	-3843516	3711	280 51 72.8	55.4	+0.08	926503	
	1.5	1949034	39216	8842569	2665	3836803	6999	281 22 47.0	20.5	+0.02	926590	
	2.0	2025673	4851	8826400	6504	3829792	9990	281 53 21.2	3.6	-0.05	926504	
	2.5	2111152	0326	8809548	9660	3822484	2684	282 23 55.4	37.7	0.12	926605	
	3.0	2196468	5639	8792014	2134	3814880	5082	282 54 29.5	11.7	0.19	926624	
	3.5	+2231614	0782	-8773800	3928	-3806980	7184	283 24 63.6	45.7	-0.25	926649	
	4.0	2363582	5747	8754907	5043	3798787	8993	283 55 37.6	19.6	0.31	926682	
	4.5	2451367	0529	8735336	5478	3790298	0506	284 25 71.6	53.5	0.37	926721	
	5.0	2535962	5122	8715090	5242	3781517	1728	284 56 45.6	27.5	0.43	926768	
	5.5	2621361	3518	8694169	4329	3772443	2656	285 27 19.6	1.4	0.48	926822	
	6.0	+2704560	3715	-8672574	2742	-3763076	3292	285 57 53.5	35.2	-0.53	926884	
	6.5	2788550	7702	8650307	0483	3753418	3636	286 28 27.4	9.0	0.57	926953	
	7.0	2872326	1476	8627371	7555	3743469	3691	286 58 61.3	42.8	0.61	927029	
	7.5	2955882	5030	8603766	3958	3733229	3454	287 29 35.2	16.6	0.63	927112	
	8.0	3039211	8357	8579493	9603	3722699	2927	287 59 69.0	50.3	0.65	927200	
	8.5	+3122307	1451	-8554555	4763	-3711879	2110	288 30 42.8	24.0	-0.66	927296	
	9.0	3205164	4336	8528953	9163	3700771	1005	289 0 76.6	57.7	0.67	927397	
	9.5	3287776	6916	8502689	2913	3689374	9611	289 31 50.4	31.4	0.66	927505	
	10.0	3370135	9274	8475764	5996	3677691	7931	290 2 24.1	5.1	0.65	927620	
	10.5	3452236	1374	8448180	8429	3665721	5964	290 32 57.9	38.8	0.63	927741	
	11.0	+3534072	3209	-8419938	0186	-3653465	3711	291 3 31.6	12.4	-0.60	927868	
	11.5	3615637	4773	8391041	1297	3640924	1173	291 33 65.3	46.0	0.57	928001	
	12.0	3696924	6960	8361490	1754	3628099	8351	292 4 39.0	19.6	0.53	928139	
	12.5	3777928	7064	8331288	1569	3614991	5246	292 34 72.6	53.1	0.48	928283	
	13.0	3858641	7777	8300436	0716	3601601	1860	293 5 46.2	26.6	0.43	928432	
	13.5	+3939058	8194	-8268937	9225	-3587930	8192	293 36 19.7	0.0	-0.38	928586	
	14.0	4019171	8907	8236793	7090	3573979	4245	294 6 53.2	33.5	0.33	928744	
	14.5	4098975	8111	8214005	4305	3559748	0017	294 37 26.6	6.8	0.27	928907	
	15.0	4178462	7598	8170576	0890	3545239	5512	295 7 60.0	40.2	0.21	929075	
	15.5	4257627	6763	8136508	6330	3530453	0729	295 38 33.3	13.4	0.15	929248	
	16.0	+4336462	5599	-8101805	2136	-3515391	5671	296 8 66.4	46.4	-0.09	929425	
16.5	4414961	4039	8066469	6808	3500054	0337	296 39 39.6	19.5	-0.02	929606		
17.0	4493118	2257	8030503	0851	3484444	4730	297 9 72.5	52.3	+0.04	929792		
17.5	4570926	0066	7993910	4266	3468562	8851	297 40 45.5	25.2	0.10	929982		
18.0	4648378	7520	7956693	7058	3452410	2702	298 10 78.1	57.7	0.15	930176		
18.5	+4725468	4611	-7918855	9228	-3435988	6283	298 41 50.8	30.3	+0.20	930373		
19.0	4802190	1335	7880398	0780	3419299	9597	299 12 23.2	2.7	0.25	930574		
19.5	4878538	7684	7841325	1716	3402345	2646	299 42 55.5	34.9	0.29	930780		
20.0	4954505	3653	7801641	2041	3385124	5428	300 13 27.6	7.0	0.33	930989		
20.5	5030085	39234	7761348	1757	3367641	7948	300 43 59.4	38.7	0.36	931202		
21.0	+5105271	4422	-7720451	0869	-3349896	0206	301 14 31.1	10.3	+0.39	931418		
21.5	5180057	39210	7678952	9379	3331891	2204	301 44 62.5	41.6	0.40	931638		
22.0	5254437	3592	7636355	7291	3313626	3942	302 15 33.7	16.7	0.41	931861		
22.5	5328406	7563	7594164	4609	3296105	5424	302 45 64.7	43.6	0.41	932089		
23.0	5401958	1117	7550884	1338	3276328	6650	303 16 35.4	14.3	0.40	932321		
23.5	+5475088	4249	-7507018	7481	-3257296	7621	303 46 65.9	44.8	+0.39	932557		
24.0	5547789	6953	7462570	3942	3238011	8339	304 17 36.1	14.9	0.37	932777		
24.5	5620057	39223	7417544	8025	3218476	8807	304 47 66.1	44.8	0.34	933042		
25.0	5691885	1054	7371944	2435	3198632	9026	305 18 35.7	14.4	0.30	933292		
25.5	5763268	2439	7325774	6277	3178661	8998	305 48 65.1	43.7	0.26	933547		
26.0	+5834201	3375	-7279037	9547	-3158385	8725	306 19 34.0	12.5	+0.29	933806		
26.5	5904679	3855	7231738	2257	3137866	8209	306 49 62.8	41.2	0.17	934070		
27.0	5974696	3875	7183881	4409	3117104	7450	307 20 31.1	9.4	0.11	934339		
27.5	6044247	3429	7135472	6009	3096103	6452	307 50 59.3	37.5	+0.05	934613		
28.0	6113326	2511	7086513	7059	3074863	5215	308 21 27.0	5.2	-0.02	934893		
28.5	+6181930	1118	-7037010	7565	-3053386	3741	308 51 54.5	32.6	-0.09	935178		
29.0	6250055	39246	6986965	7529	3031674	2032	309 21 81.6	59.7	0.16	935468		
29.5	6317695	6889	6936383	6956	3009730	0091	309 52 48.5	26.5	0.23	935764		
30.0	6384845	4043	6885267	5845	2987554	7917	310 22 74.9	52.9	0.29	936065		
30.5	6451501	0702	6833622	4213	2965149	5515	310 53 41.2	19.1	0.36	936372		
31.0	+6517658	6863	-6781453	2053	-2942516	2885	311 23 67.0	44.8	-0.42	936685		

NOTE. — The accented letters correspond to the mean equinox and equator of January 0d 0.

SUN'S COÖRDINATES, 1863. 381

Date, 1863.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	
Jan. 31.5	+6583312	2521	-6728763	9372	-2919657	:0029	311 54 32.6	10.3	-0.48	937665	
Feb. 1.0	.6648459	7672	.6675557	6175	.2896574	6949	312 24 57.8	35.4	0.54	937330	
1.5	.6713094	2311	.6621839	2466	.2873269	3647	312 55 22.8	0.3	0.59	937662	
2.0	.6777213	6434	.6567613	8249	.2849742	:0122	313 25 47.4	24.9	0.64	938000	
2.5	.6840811	0036	.6512884	3529	.2825997	6380	313 55 71.8	49.2	0.68	938345	
3.0	+6303883	3112	-6457655	8309	-2802034	2419	314 26 35.8	13.2	-0.72	938606	
3.5	.6366425	5653	.6401931	2594	.2777856	8244	314 56 59.6	36.9	0.75	939052	
4.0	.7023432	7670	.6345715	6386	.2753464	3854	315 27 23.0	0.3	0.77	939414	
4.5	.7083879	9142	.6239011	9691	.2728860	9253	315 57 46.2	23.4	0.79	939783	
5.0	.7150823	0071	.6231824	2512	.2704047	4443	316 27 69.0	46.1	0.80	940157	
5.5	+7211210	0453	-6174156	4853	-2679026	9425	316 58 31.6	8.6	-0.79	940537	
6.0	.7271025	0283	.6116115	6720	.2653798	4199	317 28 53.9	30.9	0.78	940923	
6.5	.7339234	:9557	.6057492	8116	.2628365	8769	317 58 75.9	52.8	0.77	941315	
7.0	.7399002	8271	.5998323	9045	.2602729	3135	318 29 37.7	14.6	0.75	941712	
7.5	.7447146	6420	.5938781	9512	.2576893	7302	318 59 59.2	36.0	0.72	942115	
8.0	+7504720	4000	-5878782	9521	-2550858	1269	319 29 80.4	57.2	-0.68	942523	
8.5	.7561720	1005	.5818328	9075	.2524626	5040	320 0 41.4	18.1	0.64	942936	
9.0	.7618142	7433	.5757425	8180	.2498198	8614	320 30 62.1	38.8	0.59	943353	
9.5	.7673932	3279	.5636176	6839	.2471577	1996	321 0 82.5	59.1	0.54	943775	
10.0	.7729235	8533	.5634238	5059	.2444765	5186	321 31 42.7	19.2	0.48	944202	
10.5	+7783806	3235	-5572363	2842	-2417763	8187	322 1 62.6	39.0	-0.42	944633	
11.0	.7837961	7276	.5509409	:0196	.2390573	0999	322 31 82.2	58.6	0.36	945069	
11.5	.7891426	0747	.5446329	7124	.2363197	3626	323 2 41.6	17.9	0.29	945509	
12.0	.7944235	3612	.5382325	3628	.2335638	6069	323 32 60.6	36.9	0.23	945952	
12.5	.7996535	5368	.5318905	9716	.2307899	8333	324 2 79.5	55.7	0.16	946399	
13.0	+8748172	7512	-5254571	5390	-2279981	:0417	324 33 37.9	14.1	-0.10	946848	
13.5	.8009192	8533	.5189831	:0658	.2251886	2325	325 3 56.2	32.3	-0.04	947300	
14.0	.8149572	8945	.5124638	5523	.2223616	4057	325 33 74.0	50.1	+0.02	947755	
14.5	.8199367	8727	.5059147	9990	.2195175	5619	326 4 31.6	7.6	0.08	948213	
15.0	.8248511	7878	.4993214	4065	.2166564	7010	326 34 48.7	24.6	0.13	948673	
15.5	+8297321	6135	-4926894	7753	-2137786	8235	327 4 65.6	41.4	+0.18	949137	
16.0	.8344332	4273	.4860194	1060	.2108844	9295	327 34 82.1	57.8	0.22	949603	
16.5	.8392121	1519	.4731210	3994	.2079738	:0192	328 5 38.1	13.8	0.25	950072	
17.0	.8438734	8999	.4725676	6557	.2050474	0930	328 35 53.8	29.5	0.28	950543	
17.5	.8484638	4040	.4657969	8758	.2021050	1508	329 5 69.2	44.8	0.30	951017	
18.0	+8529919	9328	-4599703	:0599	-1991474	1934	329 35 84.1	59.7	+0.31	951492	
18.5	.8574543	3359	.4521185	2089	.1961742	2204	330 6 38.7	14.2	0.31	951969	
19.0	.8618510	7934	.4452319	3230	.1931861	2325	330 36 52.8	26.3	0.31	952448	
19.5	.8651813	1245	.4383112	4030	.1901833	2290	331 6 66.5	41.9	0.29	952929	
20.0	.8704459	3890	.4313570	4495	.1871660	2128	331 36 79.8	55.1	0.27	953412	
20.5	+8746418	5866	-4243698	4630	-1841344	1814	332 7 32.6	7.8	+0.25	953897	
21.0	.8787712	7163	.4173502	4441	.1810887	1350	332 37 45.0	20.2	0.22	954384	
21.5	.8828331	7795	.4102388	3934	.1780291	0765	333 7 56.9	32.0	0.18	954874	
22.0	.8869272	7744	.4032162	3115	.1749563	:0039	333 37 68.4	43.5	0.14	955366	
22.5	.8907533	7013	.3961029	1989	.1718703	9181	334 7 79.3	54.3	0.09	955860	
23.0	+8946110	5599	-3889597	:0564	-1687710	8190	334 38 29.8	4.8	+0.04	956357	
23.5	.8984003	3500	.3817869	8843	.1656590	7072	335 8 39.8	14.7	-0.02	956856	
24.0	.9021218	0714	.3745854	6835	.1625347	5830	335 38 49.3	24.2	0.08	957357	
24.5	.9057724	7228	.3673556	4544	.1593980	4465	336 8 58.3	33.1	0.14	957861	
25.0	.9093548	3071	.3600982	1976	.1562493	2979	336 38 66.7	41.5	0.20	958369	
25.5	+9128679	8210	-3528138	9139	-1530888	1376	337 8 74.7	49.4	-0.27	958880	
26.0	.9163114	2654	.3455028	6035	.1499169	9658	337 38 82.1	56.8	0.33	959394	
26.5	.9196451	6400	.3381660	2674	.1467336	7827	338 9 29.1	3.7	0.40	959911	
27.0	.9228838	9446	.3303038	9058	.1435395	5887	338 39 35.5	10.1	0.46	960432	
27.5	.9262224	1791	.3234168	5194	.1403345	3839	339 9 41.5	16.0	0.53	960956	
28.0	+92993855	3431	-3160057	1089	-1371191	1686	339 39 46.9	21.4	-0.59	961483	
28.5	.9324782	4367	.3085709	6747	.1338934	9431	340 9 51.8	26.2	0.64	962014	
Mar. 1.0	.9355002	4596	.3011130	2174	.1306577	7075	340 39 56.2	30.6	0.69	962549	
1.5	.9384514	4117	.2936326	7376	.1274122	4622	341 9 60.1	34.4	0.73	963088	
2.0	.9413317	2930	.2861303	2359	.1241571	2072	341 39 63.4	37.7	0.77	963630	
2.5	+9441407	1029	-2786065	7127	-1208926	9429	342 9 66.3	40.5	-0.80	964176	

382 SUN'S COÖRDINATES, 1863.

Date, 1863.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .
Mar. 3.0	+ .9468785	8417	- .2710618	1685	- .1176191	6695	342° 39' 68.7	42.9	- .82	964726
3.5	.9454449	5090	.2634967	6040	.1143367	3872	343 9 70.6	44.7	0.83	965281
4.0	.9521396	1047	.2559119	0197	.1110456	0962	343 39 72.1	46.2	0.84	965839
4.5	.9546626	6286	.2483078	4162	.1077460	7967	344 9 73.1	47.1	0.84	966402
5.0	.9571138	0838	.2406850	7939	.1044384	4892	344 39 73.6	47.5	0.84	966968
5.5	+ .9594930	4609	- .2330440	1535	- .1011229	1738	345 9 73.7	47.6	- .82	967538
6.0	.9618000	7633	.2253854	4954	.0977998	8508	345 39 73.3	47.2	0.81	968112
6.5	.9640347	0046	.2177097	8202	.0944692	5203	346 9 72.5	46.3	0.78	968689
7.0	.9661963	1677	.2100175	1235	.0911315	1827	346 39 71.2	45.0	0.75	969270
7.5	.9682862	2581	.2023093	4208	.0877867	8380	347 9 69.5	43.2	0.71	969854
8.0	+ .9703028	2758	- .1945857	6077	- .0844351	4865	347 39 67.3	41.0	- .66	970442
8.5	.9722465	2295	.1868473	9598	.0810772	1287	348 9 64.7	38.3	0.61	971033
9.0	.9741171	0922	.1790945	2075	.0777131	7647	348 39 61.7	35.3	0.55	971627
9.5	.9759145	8996	.1713280	4415	.0743429	3946	349 9 58.3	31.8	0.49	972223
10.0	.9776387	6159	.1635483	6622	.0709667	0185	349 39 54.5	28.0	0.43	972822
10.5	+ .9792895	2677	- .1557558	8702	- .0675850	6369	350 9 50.3	23.8	- .37	973424
11.0	.9808666	8459	.1479514	0662	.0641983	2503	350 39 45.6	19.1	0.30	974028
11.5	.9823701	3504	.1401353	2596	.0608065	8586	351 9 40.6	14.0	0.23	974635
12.0	.9837997	7811	.1323085	4242	.0574101	4623	351 39 35.0	8.4	0.16	975243
12.5	.9851553	1378	.1244713	5874	.0540093	0616	352 9 29.1	2.4	0.10	975853
13.0	+ .9864368	4204	- .1166245	7410	- .0506041	6564	352 38 82.7	56.0	- .04	976464
13.5	.9876441	6288	.1087686	8855	.0471949	2472	353 8 75.9	49.1	+ .02	977076
14.0	.9887770	7629	.1009042	0215	.0437821	8345	353 38 68.7	41.9	0.07	977690
14.5	.9898354	8223	.0930318	1495	.0403661	4185	354 8 61.0	34.1	0.12	978304
15.0	.9908193	8073	.0851521	2702	.0369470	9995	354 38 52.9	26.0	0.16	978919
15.5	+ .9917286	7177	- .0772656	3841	- .0335246	5772	355 8 44.4	27.4	+ .20	979534
16.0	.9925633	5535	.0693729	4917	.0300999	1525	355 38 35.4	8.4	0.23	980150
16.5	.9933233	3146	.0614747	5939	.0266727	7253	356 7 86.0	58.9	0.26	980766
17.0	.9940085	0009	.0535717	6912	.0232435	2961	356 37 76.1	49.0	0.28	981381
17.5	.9946188	6123	.0456645	7843	.0198124	8650	357 7 65.7	38.5	0.30	981997
18.0	+ .9951542	1488	- .0377537	8738	- .0163799	4325	357 37 54.9	27.7	+ .31	982612
18.5	.9956147	6104	.0293399	9613	.0129462	9988	358 7 43.5	16.2	0.30	983227
19.0	.9960003	9971	.0219239	0446	.0095114	5640	358 37 31.8	4.5	0.29	983842
19.5	.9963109	3088	.0140062	1272	.0060759	1285	359 6 79.4	52.0	0.26	984457
20.0	.9965465	5456	- .0060875	2087	- .0026402	6928	359 36 66.6	39.2	0.23	985071
20.5	+ .9967072	7074	+ .0018317	7102	+ .0007958	7432	0 6 53.3	25.9	+ .19	985684
21.0	.9967931	7945	.0097507	6290	.0042316	1790	0 36 39.4	12.0	0.15	986296
21.5	.9968042	8967	.0176690	5470	.0076672	6146	1 5 85.1	57.6	0.10	986908
22.0	.9967405	7442	.0255858	4636	.0111020	0495	1 35 70.1	42.6	+ .05	987520
22.5	.9966021	6063	.0335005	3781	.0145358	4833	2 5 54.7	27.1	- .01	988132
23.0	+ .9963890	3950	+ .0414123	2897	+ .0179686	9162	2 35 38.6	11.0	- .07	988743
23.5	.9961014	1085	.0493207	1979	.0213999	3475	3 4 82.0	54.3	0.14	989353
24.0	.9957334	7477	.0572250	1020	.0248293	7770	3 34 64.8	37.1	0.20	989963
24.5	.9953031	3125	.0651247	0015	.0282566	2043	4 4 47.1	19.3	0.27	990572
25.0	.9947922	8023	.0730191	8958	.0316815	6293	4 34 28.7	0.9	0.33	991181
25.5	+ .9942073	2191	+ .0809077	7842	+ .0351040	0518	5 3 69.8	41.9	- .40	991791
26.0	.9935434	5614	.0887809	6663	.0385239	4718	5 33 50.2	22.3	0.46	992400
26.5	.9928156	8298	.0966651	5413	.0419408	8887	6 3 30.2	2.2	0.52	993010
27.0	.9920091	0245	.1045329	4090	.0453545	3025	6 32 69.4	41.3	0.57	993620
27.5	.9911290	1456	.1123926	2685	.0487645	7126	7 2 48.2	20.1	0.63	994231
28.0	+ .9901753	1931	+ .1202436	1194	+ .0521706	1188	7 31 86.3	58.2	- .68	994842
28.5	.9891483	1673	.1280854	9611	.0555728	5211	8 1 63.9	35.7	0.73	995455
29.0	.9880481	0653	.1359173	7929	.0589709	9193	8 31 40.9	12.7	0.77	996068
29.5	.9868749	8963	.1437388	6143	.0623646	3131	9 0 77.3	49.0	0.80	996682
30.0	.9856290	6516	.1515493	4247	.0657534	7020	9 30 53.2	24.9	0.83	997296
30.5	+ .9843102	3340	+ .1593483	2236	+ .0691372	0850	10 0 28.5	0.2	- .85	997912
31.0	.9829189	9439	.1671352	0104	.0725161	4649	10 29 63.2	34.9	0.86	998528
31.5	.9814553	4815	.1749096	7848	.0758894	8383	10 59 37.4	9.0	0.86	999145
Apr. 1.0	.9799193	9467	.1826710	5461	.0792571	2061	11 28 71.0	42.6	0.85	999764
1.5	.9783112	3398	.1904188	2738	.0826190	5681	11 58 44.1	15.6	0.84	000385
2.0	+ .9766311	6609	+ .1981525	0275	+ .0859747	9239	12 27 76.6	48.1	- .82	001006

SUN'S COÖRDINATES, 1863. 383

Date, 1863.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .
Apr. 2.5	+9748792	9102	+2058711	7460	+0803241	2734	12 57 48.7	20.1	-0.79	001620
3.0	9730555	0877	2135756	4505	0926671	6165	13 26 80.2	51.6	0.76	002253
3.5	9711603	1927	2112640	1388	0960034	9527	13 56 51.3	22.6	0.72	002879
4.0	9691938	2235	2280361	8109	0993327	2824	14 25 81.8	53.1	0.68	003505
4.5	9671561	1920	2365915	4663	1026546	6044	14 55 51.8	23.0	0.63	004132
5.0	+9650474	0846	+2442296	1044	+1059690	9190	15 24 81.4	52.6	-0.57	004759
5.5	9628679	9063	2518498	7246	1092758	2259	15 54 50.5	21.6	0.51	005388
6.0	9606179	6575	2594518	3267	1125745	5248	16 23 79.1	50.2	0.45	006018
6.5	9582974	3382	2670350	9099	1158650	8154	16 53 47.2	18.2	0.39	006649
7.0	9559065	9485	2745986	4736	1191473	0979	17 22 74.9	45.9	0.32	007279
7.5	+9534454	4886	+2821426	0177	+1224211	3718	17 52 42.1	13.0	-0.26	007910
8.0	9509142	9587	2896661	5413	1256859	6368	18 21 68.9	39.8	0.19	008541
8.5	9483131	3588	2971686	0438	1289416	8926	18 51 35.3	6.1	0.12	009172
9.0	9456423	6893	3046499	5252	1321879	1391	19 20 61.2	32.0	-0.06	009802
9.5	9429019	9501	3121090	9844	1354247	3760	19 49 86.7	57.4	0.00	010432
10.0	+9400922	1417	+3195457	4212	+1386519	6034	20 19 51.8	22.5	+0.06	011061
10.5	9372133	2640	3269593	8349	1418691	8208	20 48 76.5	47.1	0.11	011690
11.0	9342655	3174	3343494	2252	1450759	0278	21 18 40.7	11.3	0.16	012317
11.5	9312490	3021	3417152	5911	1482722	2243	21 47 64.5	35.0	0.20	012943
12.0	9281640	2183	3490561	9322	1514576	4099	22 16 87.9	58.4	0.24	013568
12.5	+9250107	0662	+3563717	2479	+1546319	5844	22 46 50.8	21.2	+0.27	014192
13.0	9217895	8463	3636615	5379	1577948	7475	23 15 73.3	43.7	0.30	014813
13.5	9185005	5585	3709248	8013	1609463	8992	23 45 35.3	5.6	0.31	015432
14.0	9151439	2032	3781610	0377	1640862	0303	24 14 56.9	27.2	0.32	016050
14.5	9117290	7805	3853698	2467	1672142	1675	24 43 78.0	48.2	0.31	016665
15.0	+9082291	2909	+3925505	4276	+1703209	2834	25 13 38.7	8.9	+0.30	017277
15.5	9046713	7343	3997026	5799	1734330	3867	25 42 59.0	29.1	0.28	017887
16.0	9010469	1111	4068254	7029	1765234	4774	26 11 78.8	48.9	0.26	018494
16.5	8973562	4216	4139187	7964	1796010	5552	26 41 38.2	8.2	0.23	019098
17.0	8935996	6663	4209816	8596	1826655	6200	27 10 57.1	27.1	0.20	019699
17.5	+8897774	8453	+4280139	8921	+1857167	6714	27 39 75.6	45.5	+0.16	020297
18.0	8858899	9591	4350147	8132	1887541	7091	28 9 33.5	3.4	0.11	020891
18.5	8819374	9078	4419838	8621	1917776	7329	28 38 51.1	20.9	+0.06	021482
19.0	8779203	9920	4489203	7993	1947870	7426	29 7 68.0	37.8	-0.01	022070
19.5	8738389	9118	4558239	7032	1977821	7380	29 36 84.6	54.3	0.07	022655
20.0	+8696936	7678	+4626939	5735	+2007625	7187	30 6 40.5	10.2	-0.13	023236
20.5	8654848	5632	4695299	4098	2037282	6847	30 35 56.0	25.6	0.20	023815
21.0	8612129	2936	4763312	2114	2066789	6357	31 4 70.9	40.5	0.27	024390
21.5	8568782	9561	4830975	9780	2096144	5715	31 33 85.4	54.9	0.33	024962
22.0	8524812	5634	4898282	7091	2125345	4919	32 3 39.2	8.7	0.39	025531
22.5	+8480222	1026	+4965220	4041	+2154390	3967	32 32 52.7	22.1	-0.43	026097
23.0	8435016	5833	5031812	0628	2183277	2857	33 1 65.4	34.8	0.51	026661
23.5	8389197	9026	5098927	6846	2212005	1588	33 30 77.8	47.1	0.56	027222
24.0	8342771	3613	5163867	2690	2240570	0157	33 59 89.5	58.8	0.61	027780
24.5	8295740	6594	5229331	8157	2268972	8562	34 29 40.8	10.0	0.66	028336
25.0	+8248109	8975	+5294412	3242	+2297908	6902	34 58 51.5	20.6	-0.71	028889
25.5	8199881	9759	5359107	7941	2325277	4874	35 27 61.8	30.8	0.74	029440
26.0	8151062	1952	5423411	2249	2353176	2777	35 56 71.4	40.4	0.77	029989
26.5	8101654	2556	5487319	6161	2380905	0509	36 25 80.7	49.6	0.79	030536
27.0	8051663	2577	5550827	9673	2408460	8068	36 54 89.3	58.2	0.81	031081
27.5	+8001092	2018	+5613931	2781	+2435840	5451	37 24 37.6	6.4	-0.80	031625
28.0	7949946	9884	5676627	5482	2463043	2658	37 53 45.2	14.0	0.81	032166
28.5	7898229	9179	5738911	7771	2490068	9686	38 22 52.4	21.1	0.80	032706
29.0	7845944	6906	5800778	9642	2516912	6534	38 51 59.0	27.7	0.78	033244
29.5	7793096	4070	5862226	1094	2543575	3201	39 20 65.2	33.8	0.76	033781
30.0	+7739689	9675	+5923249	2122	+2570053	9683	39 49 70.8	39.3	-0.73	034316
30.5	7683728	6726	5983845	2723	2596347	5981	40 18 76.0	54.4	0.60	034850
May 1.0	7631215	2225	6044009	2892	2622454	2092	40 47 80.7	49.1	0.65	035382
1.5	7576155	7177	6103738	2626	2648373	8015	41 16 85.0	53.3	0.60	035914
2.0	7520552	1586	6163029	1922	2674102	3748	41 45 88.8	57.1	0.55	036445
2.5	+7464410	5456	+6221878	0776	+2699640	9290	42 15 32.2	0.4	-0.49	036974

384 SUN'S COÖRDINATES, 1863.

Date, 1863.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	
May	3.0	+7407732	8790	+6280280	9184	+2724984	4638	42 44 35.2	3.4	-0.43	037501
	3.5	7350523	1593	6338235	7144	2750134	3792	43 13 37.8	5.9	0.37	038028
	4.0	7292786	3868	6395735	4650	2775086	4748	43 42 40.0	8.1	0.30	038553
	4.5	7234525	5619	6452780	1701	2799840	9506	44 11 41.8	9.8	0.23	039077
	5.0	7175745	6850	6509363	8290	2824393	4063	44 40 43.2	11.1	0.16	039599
	5.5	+7116449	7566	+6565481	4414	+2848746	8420	45 9 44.3	12.1	-0.09	040119
	6.0	7056642	7771	6621129	0068	2872894	2572	45 38 44.9	12.7	-0.02	040638
	6.5	6996328	7469	6676304	5249	2896838	6520	46 7 45.3	13.0	+0.05	041154
	7.0	6935510	6663	6731003	9955	2920574	0260	46 36 45.2	12.9	0.11	041669
	7.5	6874192	5357	6785221	4179	2944102	3792	47 5 44.8	12.4	0.16	042181
	8.0	+6812381	3558	+6838955	7920	+2967420	7115	47 34 44.0	11.6	+0.21	042691
	8.5	6750078	1267	6892202	1173	2990527	0226	48 3 42.9	10.4	0.25	043199
	9.0	6687289	8489	6944956	3034	3013419	3123	48 32 41.5	8.9	0.29	043703
	9.5	6624017	5229	6997216	6201	3036094	5822	49 1 39.8	7.1	0.32	044204
	10.0	6563268	1491	7048977	7969	3058553	8266	49 30 37.7	4.9	0.34	044702
10.5	+6496044	7279	+7100235	9234	+3080794	0511	49 59 35.5	2.6	+0.36	045197	
11.0	6431351	2597	7150986	9992	3102815	2537	50 28 32.9	0.0	0.38	045688	
11.5	6366193	7451	7201226	0239	3124614	4340	50 56 89.9	56.9	0.38	046176	
12.0	6300574	1843	7253952	9972	3146189	5920	51 25 86.6	53.6	0.37	046659	
12.5	6234499	5780	7300160	9187	3167540	7276	51 54 83.1	50.0	0.35	047138	
13.0	+6167973	9265	+7348845	7880	+3188662	8403	52 23 79.1	46.0	+0.33	047613	
13.5	6101001	2305	7397004	6046	3209555	9301	52 52 75.0	41.8	0.30	048084	
14.0	6033588	4903	7444633	3683	3230219	9970	53 21 70.4	37.1	0.27	048550	
14.5	5965740	7066	7491728	0785	3250651	0407	53 50 65.6	32.2	-0.23	049011	
15.0	5897462	8799	7538287	7352	3270849	0610	54 19 60.4	26.9	0.19	049468	
15.5	+5823759	0107	+7584305	3378	+3290813	0579	54 48 55.0	21.4	+0.14	049920	
16.0	5759637	0996	7629778	8859	3310540	0311	55 17 49.1	15.5	0.09	050367	
16.5	5690101	1471	7674703	3792	3330029	9805	55 46 43.0	9.3	+0.02	050809	
17.0	5620156	1537	7719077	8174	3349279	9060	56 15 36.5	2.8	-0.04	051245	
17.5	5549808	1200	7762896	2001	3368288	8074	56 43 89.7	55.9	0.10	051676	
18.0	+5479062	0465	+7806159	5272	+3387056	6847	57 12 82.5	48.7	-0.16	052101	
18.5	5407924	9338	7848861	7982	3405581	5377	57 41 75.0	41.1	0.22	052521	
19.0	5336307	7821	7890999	0128	3423861	3662	58 10 67.1	33.1	0.27	052936	
19.5	5264489	5924	7932571	1708	3441895	1701	58 39 58.9	24.8	0.33	053346	
20.0	5192206	3651	7973573	2719	3459682	9494	59 8 50.3	16.1	0.38	053750	
20.5	+5119551	1037	+8014003	3158	+3477220	7037	59 37 41.3	7.1	-0.44	054149	
21.0	5046532	7998	8053857	3021	3494510	4332	60 5 91.8	57.5	0.50	054544	
21.5	4973155	4632	8093133	2306	3511550	1377	60 34 82.1	47.7	0.55	054934	
22.0	4899424	0911	8131830	1012	3528337	8169	61 3 71.8	37.4	0.59	055318	
22.5	4823347	6845	8169943	9134	3544872	4709	61 32 61.4	26.9	0.63	055697	
23.0	+4750928	2436	+8207472	6672	+3561154	0997	62 1 50.5	15.9	-0.67	056071	
23.5	4676173	7691	8244415	3624	3577181	7029	62 30 39.3	4.6	0.69	056440	
24.0	4601089	2617	8280767	9985	3592953	2807	62 58 87.7	52.9	0.70	056805	
24.5	4525680	7218	8316529	5756	3608470	8329	63 27 75.8	40.9	0.70	057166	
25.0	4449954	1502	8351697	0933	3623730	3595	63 56 63.4	28.4	0.69	057523	
25.5	+4373916	5474	+8386270	5515	+3638731	8601	64 25 50.8	15.7	-0.68	057876	
26.0	4297570	9137	8420247	9501	3653473	3349	64 54 37.7	2.6	0.67	058225	
26.5	4220923	2500	8453625	2888	3667956	7837	65 22 84.3	49.1	0.65	058570	
27.0	4143980	5566	8486402	5675	3682180	2067	65 51 70.5	35.3	0.62	058912	
27.5	4166747	8343	8518577	7860	3696143	6035	66 20 56.5	21.2	0.58	059250	
28.0	+3989228	0833	+8550147	9440	+3709844	9742	66 49 42.0	6.6	-0.54	059584	
28.5	3911430	3044	8581111	0414	3723281	3184	67 17 87.3	51.6	0.49	059916	
29.0	3833358	4981	8611469	0782	3736455	6364	67 46 72.2	36.6	0.44	060244	
29.5	3755018	6650	8641218	0541	3749365	9279	68 15 56.9	21.2	0.38	060569	
30.0	3676414	8055	8670356	9690	3762010	1930	68 44 41.2	5.4	0.32	060890	
30.5	+3597554	9204	+8698882	8226	+3774388	4314	69 12 85.2	49.3	-0.25	061209	
31.0	3518440	0098	8726793	6148	3786500	6432	69 41 69.0	33.1	0.18	061526	
31.5	3439079	0746	8754090	3456	3798345	8283	70 10 52.5	16.5	0.11	061841	
June 1.0	3359474	1149	8780765	0142	3809924	9863	70 38 95.8	59.8	-0.05	062149	
1.5	3279632	1315	8806824	6211	3821234	1184	71 7 78.8	42.7	+0.02	062457	
2.0	+3199560	1252	+8832262	1661	+3832275	2231	71 36 61.6	25.4	+0.09	062760	

SUN'S COÖRDINATES, 1863. 385

Date, 1863.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .
June 2.5	+3119262	:0962	+8857078	6488	+3843046	3008	72° 5' 44.2"	7.9	+0.15	0.0
3.0	3038742	:0451	8881271	0692	3853546	3514	72 33 86.5	50.1	0.21	063061
3.5	2958007	9724	8904838	427.0	3863775	3749	73 2 68.7	32.2	0.27	063358
4.0	2877063	8789	8927778	7222	3873731	3711	73 31 50.6	14.0	0.33	063653
4.5	2795914	7648	8950090	:9545	3883414	3400	73 59 92.4	55.7	0.38	063944
5.0	+2714565	6307	+8971771	0238	+3892823	2815	74 28 73.9	37.2	+0.42	064232
5.5	2633023	4773	8992822	2301	3901958	1956	74 57 55.4	18.6	0.46	064517
6.0	2551291	3049	9013240	2731	3910818	0823	75 25 96.5	59.6	0.49	064798
6.5	2469376	:1142	9033025	2528	3919402	9413	75 54 77.7	40.7	0.51	065075
7.0	2387284	9058	9052173	1689	3927711	7729	76 23 58.6	21.5	0.52	065348
7.5	+2306019	6801	+9070685	0213	+3935743	5767	76 52 39.5	2.3	+0.53	065617
8.0	2222587	4377	9088556	8097	3943496	3527	77 20 80.2	42.9	0.53	065882
8.5	2139904	:1792	9105786	5340	3950970	1007	77 49 60.9	23.5	0.52	066143
9.0	2057245	9051	9122374	1941	3958165	8209	78 18 41.3	3.8	0.50	066399
9.5	1974347	6161	9138317	7897	3965080	5130	78 46 81.7	44.1	0.48	066649
10.0	+1891305	3126	+9153613	3206	+3971715	1772	79 15 61.9	24.3	+0.45	066895
10.5	1808125	9953	9168261	7867	3978069	8132	79 44 42.1	4.4	0.41	067136
11.0	1724813	6648	9182261	1881	3984141	4211	80 12 82.1	44.4	0.36	067373
11.5	1641375	3217	9195611	5244	3989930	:0006	80 41 62.1	24.3	0.31	067601
12.0	1557820	9663	9208309	7956	3995436	5519	81 10 41.8	3.9	0.26	067825
12.5	+1474151	6007	+9220355	0015	+4000660	0749	81 38 81.6	43.6	+0.21	068044
13.0	1390376	2239	9231747	1421	4005600	5696	82 7 61.1	23.0	0.15	068257
13.5	1306500	8370	9242486	2174	4010256	0358	82 36 40.6	2.4	0.09	068464
14.0	1222530	4407	9252569	2271	4014628	4738	83 4 79.8	41.5	+0.03	068664
14.5	1138472	:0356	9261996	1712	4018716	8832	83 33 59.1	20.7	-0.04	068858
15.0	+1054332	6222	+9270768	0498	+4022519	2642	84 1 98.1	59.7	-0.10	069046
15.5	0970115	2011	9278883	8627	4026036	6165	84 30 77.1	38.6	0.17	069228
16.0	0885831	7733	9286339	6397	4029267	9403	84 59 55.9	17.3	0.23	069403
16.5	0801483	3391	9293137	2309	4032213	2355	85 27 94.7	56.0	0.29	069572
17.0	0717079	8992	9299275	9062	4034873	5022	85 56 73.2	34.4	0.35	069734
17.5	+0632625	4543	+9304754	4555	+4037247	7402	86 25 51.7	12.8	-0.40	069890
18.0	0548127	:0050	9309572	9388	4039335	9497	86 53 89.9	50.9	0.44	070039
18.5	0463591	5519	9313731	3561	4041137	1306	87 22 68.1	29.0	0.48	070182
19.0	0379026	:0958	9317230	7075	4042653	2820	87 51 46.0	6.8	0.51	070318
19.5	0294438	6375	9320069	2928	4043883	4065	88 19 83.9	44.6	0.54	070448
20.0	+0209829	:1770	+9322248	2122	+4044827	5016	88 48 61.5	22.2	-0.56	070572
20.5	0125210	7155	9323768	3667	4045486	5681	89 16 99.1	59.7	0.57	070690
21.0	+0040586	2533	9324629	4533	4045859	6061	89 45 76.4	37.0	0.57	070802
21.5	-0044038	2085	9324831	4750	4045947	6156	90 14 53.6	14.1	0.56	070908
22.0	0128654	6607	9324375	4309	4045750	5966	90 42 90.6	51.0	0.55	071009
22.5	-0213258	1297	+9323261	3210	+4045268	5491	91 11 67.5	27.8	-0.53	071103
23.0	0237841	5877	9321491	1455	4044501	4731	91 40 44.2	4.4	0.50	071193
23.5	0382400	0433	9319063	9042	4043450	3687	92 8 80.9	41.0	0.46	071277
24.0	0466928	4958	9315979	5073	4042113	2357	92 37 57.3	17.3	0.41	071356
24.5	0551423	:9447	9312239	2248	4040492	0743	93 5 93.7	53.6	0.36	071430
25.0	-0635869	3893	+9307845	7869	+4038588	8846	93 34 69.8	29.7	-0.31	071499
25.5	0720270	:8201	9302797	2836	4036401	6666	94 3 45.9	5.7	0.25	071564
26.0	0804617	2635	9297097	7151	4033931	4203	94 31 81.8	41.5	0.19	071624
26.5	0888903	6918	9290744	0813	4031179	1458	95 0 57.6	17.2	0.12	071680
27.0	0973125	1138	9283740	3825	4028143	8430	95 28 93.4	52.9	-0.06	071732
27.5	-1057276	5286	+9276086	6186	+4024825	5117	95 57 69.0	28.4	+0.01	071779
28.0	1141350	:9358	9267782	7898	4021225	1523	96 26 44.6	3.9	0.08	071823
28.5	1225342	3348	9258829	8960	4017343	7648	96 54 80.1	39.3	0.15	071862
29.0	1309247	7251	9249228	9375	4013182	3493	97 23 55.6	14.7	0.22	071898
29.5	1393059	1061	9238979	9141	4008739	9057	97 51 91.0	50.0	0.28	071930
30.0	-1476773	4773	+9228084	8262	+4004016	4340	98 20 66.4	25.3	+0.34	071959
30.5	1560383	:8381	9216544	6738	3999012	9342	98 49 41.7	0.5	0.40	071984
July 1.0	1643885	1881	9204359	4569	3993729	4066	99 17 77.0	35.7	0.45	072006
1.5	1727272	5266	9191530	1756	3988165	8508	99 46 52.3	10.9	0.50	072024
2.0	1810539	:8531	9178057	8299	3982322	2672	100 14 87.6	46.1	0.55	072039
2.5	1893680	1570	+9163941	4199	+3976199	6555	100 43 63.0	21.4	+0.58	072049

386 SUN'S COÖRDINATES, 1863.

Date, 1863.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	
July 3.0	—1976691	4680	+9149182	9456	+3969796	0159	101 11 98.3	56.6	+0.61	0.0	
	2059565	7553	.9133782	4072	3963114	3483	101 40 73.8	32.0	0.63	072057	
	2142297	0284	.9117742	8048	3956154	6530	102 9 49.2	7.4	0.64	072052	
	2224881	2869	.9101062	1384	3948916	9298	102 37 84.7	42.8	0.65	072043	
	2307313	5300	.9083744	4083	3941402	1791	103 6 60.3	18.3	0.65	072030	
	—2389586	7573	+9065788	6143	+3933610	4005	103 34 95.9	53.8	+0.64	072013	
	2471694	.9681	.9047195	7567	3925542	5044	104 3 71.7	29.5	0.62	071942	
	2553632	1619	.9027966	8354	3917197	7605	104 32 47.5	5.2	0.60	071966	
	2635393	3380	.9008103	8508	3908576	8091	105 0 83.5	41.1	0.58	071935	
	2716973	4960	.8987606	8027	3899681	0103	105 20 59.5	17.0	0.55	071899	
8.0	—2798365	6353	+8966475	6913	+3890511	0940	105 57 96.7	53.2	+0.50	071859	
	2879565	7553	.8944711	5166	3881066	1502	106 26 71.9	29.3	0.47	071813	
	2960565	.8554	.8922316	2788	3871347	0790	106 55 48.3	5.7	0.42	071762	
	3041361	.9351	.8899291	9779	3861355	1805	107 23 84.8	42.1	0.36	071706	
	3121945	.9936	.8875636	6141	3851090	1547	107 52 61.4	18.6	0.30	071644	
	—3202313	0305	+8851354	1875	+3840552	1016	108 20 98.2	55.3	+0.24	071576	
	3282457	0451	.8826447	6985	3829742	0213	108 49 75.1	32.1	0.18	071502	
	3362373	0369	.8800916	1471	3818660	9137	109 18 52.1	9.0	0.11	071422	
	3442053	0051	.8774761	5333	3807307	7791	109 46 89.3	46.1	+0.05	071336	
	3521493	.9494	.8747985	8574	3796684	6175	110 15 66.5	23.2	—0.01	071244	
13.0	—3600684	8688	+8720589	1195	+3783793	4290	110 44 43.9	0.6	—0.07	071146	
	3679623	7630	.8692574	3197	3771634	2138	111 12 81.3	37.9	0.13	071041	
	3758301	6311	.8663044	4584	3759208	9718	111 41 58.9	15.5	0.19	070930	
	3836715	4728	.8634619	5355	3746516	7033	112 9 96.6	53.1	0.24	070812	
	3914857	2873	.8604842	5515	3733559	4082	112 38 74.4	30.8	0.29	070688	
	—3992722	0741	+8574375	5065	+3720387	0867	113 7 52.4	8.7	—0.23	070657	
	4070305	.8328	.8543301	4008	3706852	7388	113 35 90.4	46.6	0.37	070420	
	4147599	5626	.8511620	2344	3693104	3647	114 4 68.6	24.7	0.40	070276	
	4224598	2629	.8479336	0076	3679095	9644	114 33 46.7	2.7	0.42	070125	
	4301297	.9312	.8446450	7208	3664826	5382	115 1 85.1	41.0	0.43	069967	
18.0	—4377690	5730	+8412967	4742	+3650297	0859	115 30 63.5	19.4	—0.44	069804	
	4453771	1815	.8378888	9680	3636511	6080	115 58 102.1	57.9	0.44	069635	
	4529533	7582	.8344217	5026	3620469	1044	116 27 80.6	36.4	0.43	069459	
	4604972	3026	.8308356	9781	3606171	5753	116 56 59.3	15.0	0.41	069277	
	4680082	.8141	.8273110	3952	3589619	0207	117 24 98.0	53.6	0.38	069090	
	—4754856	2920	+8236680	7538	+3573815	4409	117 53 76.8	32.3	—0.35	068897	
	4829292	7362	.8190669	0644	3557758	8358	118 22 55.7	11.1	0.32	068698	
	4903382	1458	.8162020	2072	3541450	2056	118 50 94.6	49.9	0.28	068494	
	4977123	5205	.8123016	4825	3524894	5506	119 19 73.7	28.9	0.23	068285	
	5050510	.8598	.8085180	6106	3508090	8708	119 48 52.8	7.9	0.18	068071	
23.0	—5123535	1629	+8045874	6817	+3491037	1661	120 16 92.1	47.2	—0.12	067851	
	5196196	4296	.8006092	6962	3473740	4370	120 45 71.4	26.4	—0.06	067627	
	5268487	6593	.7965567	6544	3456198	6834	121 14 50.9	5.9	+0.01	067398	
	5340404	.8516	.7924572	5566	3438414	9066	121 42 90.4	45.3	0.07	067165	
	5411940	0059	.7883019	4030	3420389	1037	122 11 70.1	24.9	0.14	066927	
	—5483094	1220	+7840913	1941	+3402124	2778	122 40 49.9	4.6	+0.21	066685	
	5553857	1990	.7798255	9909	3383620	4280	123 8 89.8	44.4	0.28	066440	
	5624228	2368	.7765451	6112	3364879	5545	123 37 69.9	24.4	0.35	066191	
	5694200	2348	.7711302	2379	3345901	6572	124 6 50.0	4.5	0.41	065939	
	5763771	1927	.7667013	8107	3326688	7365	124 34 90.4	44.8	0.47	065683	
28.0	—5832933	1097	+7622185	3205	+3307241	7923	125 3 70.9	25.3	+0.53	065424	
	5901685	.9857	.7576223	7950	3287562	8250	125 32 51.6	5.9	0.58	065161	
	5970020	.8201	.7530028	2071	3267650	8343	126 0 92.5	46.8	0.62	064895	
	6037935	6124	.7484550	5664	3247509	8298	126 29 73.6	27.8	0.66	064626	
	6105424	3622	.7437554	8729	3227139	7843	126 58 54.8	8.9	0.70	064353	
	—6172484	0691	+7390081	1972	+3206543	7253	127 26 96.3	50.3	+0.73	064078	
	6239110	7326	.7342088	3295	3185720	6435	127 55 77.9	31.8	0.75	063799	
	6305282	3523	.7293578	4801	3164674	5395	128 24 59.0	13.7	0.76	063518	
	6371042	.9277	.7244555	5794	3143405	4131	128 52 102.0	55.8	0.76	063233	
	6436339	4584	.7195022	6277	3121913	2645	129 21 84.5	38.2	0.75	062945	
Aug. 1.0	—6501184	.9439	+7144079	6250	+3100199	0936	129 50 67.2	20.9	+0.74	062654	

SUN'S COÖRDINATES, 1863. 387

Date, 1863.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	
Aug. 2.5	-.6565573	3837	+ .7004433	5720	+ .3078267	9009	130 19 50.2	3.8	+0.72	0.62360	
3.0	.6629499	7773	.7043383	4685	.3056116	6863	130 47 93.5	47.1	0.69	0.62162	
3.5	.6652960	1244	.6991835	3153	.3033748	4501	131 16 77.0	30.5	0.66	0.61760	
4.0	.6755949	4244	.6939790	1123	.3011165	1923	131 45 69.9	14.3	0.62	0.61455	
4.5	.6818464	6769	.6887253	8602	.2988368	9132	132 13 165.1	58.4	0.57	0.61146	
5.0	-.6880497	8813	+ .6834225	5580	+ .2965357	6126	132 42 89.6	42.9	+0.51	0.60833	
5.5	.6942346	0373	.6780710	2089	.2942135	2909	133 11 74.4	27.6	0.46	0.60516	
6.0	.7003105	1443	.6726712	8106	.2918701	9480	133 40 59.6	12.8	0.40	0.60196	
6.5	.7063671	2020	.6672234	3643	.2895059	5843	134 8 105.1	58.2	0.34	0.59871	
7.0	.7123739	2099	.6617280	8704	.2871210	1999	134 37 91.0	44.1	0.27	0.59542	
7.5	-.7183305	1676	+ .6561854	3293	+ .2847157	7951	135 6 77.2	30.2	+0.21	0.59208	
8.0	.7242362	0745	.6505958	7412	.2822900	3699	135 35 63.8	16.8	0.15	0.58870	
8.5	.7300908	9303	.6449597	1066	.2798441	9245	136 4 50.7	3.6	0.09	0.58527	
9.0	.7358936	7343	.6392775	4258	.2773783	4592	136 32 98.0	50.8	+0.03	0.58179	
9.5	.7416443	4862	.6335494	6992	.2748927	9741	137 1 85.6	38.3	-0.03	0.57826	
10.0	-.7473421	1852	+ .6277760	9272	+ .2723873	4692	137 30 73.5	26.1	-0.08	0.57467	
10.5	.7529669	8312	.6219575	11102	.2698625	9449	137 59 61.8	14.3	0.13	0.57103	
11.0	.7585778	4234	.6160945	2486	.2673183	4011	138 28 50.4	2.9	0.18	0.56734	
11.5	.7641147	9616	.6101874	3430	.2647150	7983	138 56 90.4	51.8	0.23	0.56360	
12.0	.7695969	4451	.6042362	3932	.2621727	2564	139 25 88.7	41.1	0.27	0.55980	
12.5	-.7750241	8736	+ .5982417	4002	+ .2595716	6558	139 54 78.3	30.6	-0.30	0.55595	
13.0	.7803959	2468	.5922045	3644	.2569520	0366	140 23 68.3	20.6	0.33	0.55204	
13.5	.7857119	5641	.5861248	2861	.2543140	3991	140 52 58.5	10.7	0.35	0.54808	
14.0	.7909716	8252	.5800031	1658	.2516578	7433	141 21 49.2	1.3	0.36	0.54406	
14.5	.7961747	0293	.5738396	0039	.2489835	0695	141 49 100.1	52.1	0.36	0.53999	
15.0	-.8013208	1772	+ .5676354	8009	+ .2462915	3779	142 18 91.4	43.4	-0.36	0.53586	
15.5	.8064094	2672	.5613902	5571	.2435818	6686	143 47 82.9	34.8	0.35	0.53168	
16.0	.8114400	2092	.5551049	2732	.2408548	9420	143 16 74.8	26.7	0.33	0.52744	
16.5	.8164123	2720	.5487798	9495	.2381105	1981	143 45 67.1	28.9	0.30	0.52316	
17.0	.8213259	1880	.5424156	5865	.2353493	4373	144 14 59.5	11.3	0.27	0.51882	
17.5	-.8261805	0440	+ .5360126	1850	+ .2325714	6598	144 43 52.3	4.0	-0.23	0.51443	
18.0	.8309756	8406	.5295716	7453	.2297769	8657	145 11 105.3	57.0	0.19	0.51000	
18.5	.8357110	5774	.5230929	2679	.2269661	0553	145 40 98.6	50.2	0.13	0.50552	
19.0	.8403864	2543	.5165769	7532	.2241391	2287	146 9 92.2	43.7	0.07	0.50099	
19.5	.8450014	8708	.5100240	2016	.2212963	3863	146 38 86.1	37.5	-0.01	0.49641	
20.0	-.8495556	4265	+ .5034350	6139	+ .2184377	5280	147 7 80.4	31.8	+0.05	0.49180	
20.5	.8540489	9213	.4968101	9003	.2155636	6543	147 36 75.0	25.3	0.11	0.48715	
21.0	.8584807	3547	.4901500	3314	.2126742	7652	148 5 69.8	21.1	0.18	0.48246	
21.5	.8628511	7267	.4834549	6376	.2097697	8611	148 34 64.9	16.1	0.24	0.47773	
22.0	.8671394	0366	.4767257	9096	.2068502	9419	149 3 60.3	11.5	0.31	0.47297	
22.5	-.8714056	2844	+ .4696265	1477	+ .2039160	0081	149 32 56.0	7.1	+0.38	0.46818	
23.0	.8755892	4696	.4631663	3526	.2009674	0598	150 1 52.1	3.2	0.44	0.46335	
23.5	.8797101	5921	.4563372	5247	.1980046	0973	150 29 108.3	59.3	0.50	0.45849	
24.0	.8837677	6513	.4494759	6645	.1950278	1208	150 58 105.0	56.1	0.56	0.45361	
24.5	.8877620	6472	.4425827	7725	.1920372	1305	151 27 102.0	52.9	0.61	0.44871	
25.0	-.8916927	5796	+ .4356584	8493	+ .1890330	1266	151 56 99.3	50.2	+0.66	0.44379	
25.5	.8955596	4481	.4287031	8952	.1860154	1093	152 25 96.9	47.7	0.70	0.43883	
26.0	.8993623	2525	.4217174	9106	.1829846	0788	152 54 94.8	45.6	0.73	0.43386	
26.5	.9031007	9026	.4147017	8065	.1799407	0352	153 23 93.2	43.9	0.76	0.42887	
27.0	.9067745	6681	.4076566	8520	.1768839	9787	153 52 91.8	42.5	0.78	0.42386	
27.5	-.9003836	2789	+ .4005823	7788	+ .1738145	9096	154 21 90.9	41.5	+0.80	0.41884	
28.0	.9139274	8245	.3934796	6771	.1707327	8280	154 50 90.3	40.9	0.81	0.41380	
28.5	.9174060	3049	.3863487	5472	.1676386	7342	155 19 90.2	40.7	0.80	0.40874	
29.0	.9208189	7196	.3791903	3898	.1645326	6284	155 48 90.4	40.9	0.79	0.40367	
29.5	.9241661	0686	.3720046	2051	.1614147	5108	156 17 91.1	41.6	0.78	0.39858	
30.0	-.9274472	3515	+ .3647024	9939	+ .1582852	3815	156 46 92.1	42.5	+0.76	0.39348	
30.5	.9306618	5679	.3575539	7564	.1551442	2407	157 15 93.7	44.0	0.73	0.38836	
31.0	.9338907	7176	.3502897	4931	.1519921	0888	157 44 95.6	45.9	0.69	0.38322	
31.5	.9368909	8006	.3430001	2045	.1488290	9259	158 13 98.1	48.3	0.64	0.37807	
Sept. 1.0	.9399048	8163	.3356857	8910	.1456551	7522	158 42 100.9	51.1	0.60	0.37290	
1.5	-.9428514	7647	+ .3283469	5531	+ .1424706	5679	159 11 104.3	54.4	+0.55	0.36771	

388 SUN'S COÖRDINATES, 1863.

Date, 1863.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	
Sept. 2.0	-.9457303	6455	+3209843	:1914	+1392758	3733	159° 40' 108.1	58.2	+0.49	0.036251	
2.5	.9485414	4584	3135983	8.63	.1360708	1685	160 10 52.5	2.5	0.43	0.035729	
3.0	.9512842	2031	.3061895	3983	.1328559	9538	160 39 57.3	7.3	0.37	0.035205	
3.5	.9539588	8796	.2987584	9631	.1296313	7294	161 8 62.6	12.5	0.30	0.034678	
4.0	.9565646	4873	.2913054	5159	.1263972	4955	161 37 68.4	18.3	0.24	0.034150	
4.5	-.9591016	0262	+2838311	:0424	+1231539	2524	162 6 74.7	24.5	+0.18	0.033619	
5.0	.9615694	4959	.2763358	5479	.1199015	:0002	162 35 81.5	31.3	0.12	0.033085	
5.5	.9639678	8962	.2688203	:0332	.1166402	7391	163 4 88.9	38.6	+0.06	0.032549	
6.0	.9662964	2268	.2612849	4986	.1133703	4693	163 33 96.7	46.4	-0.00	0.032011	
6.5	.9685551	4874	.2537303	9448	.1100920	1912	164 2 105.2	54.9	0.06	0.031470	
7.0	-.9707437	6780	+2461569	3721	+1068057	9050	164 32 54.0	3.7	-0.11	0.030925	
7.5	.9728620	7982	.2385653	7812	.1035114	6109	165 1 63.5	13.1	0.16	0.030378	
8.0	.9749096	8478	.2309561	:1727	.1002096	3092	165 30 73.3	22.0	0.20	0.029827	
8.5	.9768863	8264	.2233298	5471	.0969004	:0002	165 59 83.8	33.3	0.23	0.029273	
9.0	.9787920	7341	.2156870	9050	.0935840	6839	166 28 94.6	44.1	0.26	0.028716	
9.5	-.9806265	5706	+2080282	2469	+0902608	3608	166 57 106.1	55.5	-0.28	0.028155	
10.0	.9823892	3353	.2003541	5734	.0869309	:0310	167 27 57.9	7.3	0.30	0.027591	
10.5	.9840805	0286	.1926650	8849	.0835946	6948	167 56 70.4	19.7	0.30	0.027023	
11.0	.9857000	6501	.1849618	:1823	.0802522	3525	168 25 83.3	32.6	0.30	0.026452	
11.5	.9872476	1997	.1772449	4660	.0769039	:0043	168 54 96.7	45.9	0.28	0.025877	
12.0	-.9887232	6774	+1695150	7367	+0735501	6506	169 23 110.6	59.8	-0.26	0.025299	
12.5	.9901265	0827	.1617726	9949	.0701909	2915	169 53 65.0	14.1	0.23	0.024717	
13.0	.9914573	4156	.1540184	2412	.0668266	9272	170 22 79.8	28.9	0.21	0.024132	
13.5	.9927156	6759	.1462529	4763	.0634574	5581	170 51 95.1	44.1	0.18	0.023543	
14.0	.9939012	8636	.1384769	7008	.0600837	1844	171 20 110.8	59.8	0.14	0.022951	
14.5	-.9950141	:9786	+1306908	9152	+0567057	8065	171 50 67.0	15.9	-0.09	0.022356	
15.0	.9963540	0206	.1228954	:1203	.0533236	4244	172 19 83.6	32.5	-0.03	0.021757	
15.5	.9970210	:9897	.1150912	3166	.0499378	:0387	172 48 100.8	49.6	+0.03	0.021155	
16.0	.9979149	8857	.1072788	5046	.0465483	6492	173 18 58.3	7.1	0.10	0.020551	
16.5	.9987357	7086	.0994588	6851	.0431556	2565	173 47 76.3	25.1	0.16	0.019944	
17.0	-.9994834	4584	+0916318	8585	+0397598	8607	174 16 94.6	43.4	+0.23	0.019335	
17.5	1.0001579	1350	.0837984	:0255	.0363612	4621	174 46 53.4	2.1	0.30	0.018723	
18.0	1.0007590	7332	.0759591	:1866	.0327602	:0611	175 15 72.6	21.3	0.37	0.018109	
18.5	1.0012868	2681	.0681146	3425	.0295569	6573	175 44 92.3	41.0	0.44	0.017493	
19.0	1.0017413	7247	.0602655	4938	.0261516	2524	176 14 52.3	0.9	0.50	0.016875	
19.5	-1.0021225	1080	+0524123	6410	+0227444	8452	176 43 72.8	21.3	+0.57	0.016255	
20.0	1.0024304	4181	.0445557	7847	.0193357	4364	177 12 93.7	42.2	0.63	0.015634	
20.5	1.0026649	6547	.0366962	9255	.0159259	:0265	177 42 55.1	3.5	0.69	0.015012	
21.0	1.0028261	8181	.0288344	:0640	.0125151	6156	178 11 76.8	25.2	0.74	0.014388	
21.5	1.0029140	9081	.0209709	:2008	.0091033	2037	178 40 99.0	47.3	0.78	0.013764	
22.0	-1.0029284	9247	+0131062	3364	+0056911	7914	179 10 61.6	9.9	+0.82	0.013140	
22.5	1.0029695	8679	+0052409	4714	+0022785	3787	179 39 84.7	32.9	0.85	0.012514	
23.0	1.0027373	7379	-.0026244	3937	-.0011340	0339	180 8 108.1	56.3	0.87	0.011889	
23.5	1.0025317	5344	.0104893	2583	.0045464	4464	180 38 72.0	20.1	0.88	0.011263	
24.0	1.0022520	2578	.0183531	1219	.0079584	8585	181 7 96.3	44.4	0.89	0.010638	
24.5	-1.0019008	9078	-.0262154	:9840	-.0013697	2699	181 37 61.2	9.2	+0.89	0.010013	
25.0	1.0014755	4847	.0340756	:8440	.0147801	6804	182 6 86.4	34.4	0.89	0.009388	
25.5	1.0009770	9883	.0419331	7013	.0181894	8988	182 36 52.3	0.2	0.87	0.008764	
26.0	1.0004052	4187	.0497874	5555	.0215974	4980	183 5 78.5	26.4	0.85	0.008140	
26.5	.9997602	7759	.0576379	4059	.0250038	:9045	183 34 105.3	53.2	0.83	0.007517	
27.0	-.9990421	0630	-.0654841	2520	-.0284084	3093	184 4 72.5	20.4	+0.80	0.006895	
27.5	.9982507	2707	.0733254	0932	.0318110	7120	184 33 100.2	48.1	0.76	0.006274	
28.0	.9973864	4086	.0811615	:9293	.0352113	1125	185 3 68.4	16.3	0.72	0.005653	
28.5	.9964489	4733	.0889017	7594	.0386091	5105	185 32 97.2	45.0	0.67	0.005034	
29.0	.9954384	4650	.0968155	5832	.0420041	:9057	186 2 66.4	14.2	0.61	0.004415	
29.5	-.9943548	3836	-.1046323	3999	-.0453962	2980	186 31 96.3	44.0	+0.55	0.003798	
30.0	.9931982	2232	.1124416	2092	.0487850	6870	187 1 66.7	14.4	0.49	0.003181	
30.5	.9919685	:0017	.1202428	0104	.0521703	0725	187 30 97.6	45.2	0.42	0.002565	
Oct. 1.0	.9906659	7013	.1280354	:8030	.0555520	4544	188 0 69.1	16.7	0.36	0.001949	
1.5	.9892903	3279	.1358188	5664	.0589296	8322	188 29 101.1	48.6	0.29	0.001334	
2.0	-.9878417	8815	-.1435926	3602	-.0623029	2058	188 59 73.7	21.2	+0.23	0.000720	

SUN'S COORDINATES, 1863. 389

Date, 1863.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	
Oct. 2.5	-.9663292	3622	-.1513562	1238	-.0656718	5749	189° 28' 16.9	54.3	+0.17	0.00107	
3.0	.9847259	7701	.1591089	8766	.0690359	3933	189 58 80.7	28.1	0.11	999494	
3.5	.9830588	1652	.1668503	6181	.0723953	2088	190 28 55.1	2.4	+0.05	998881	
4.0	.9813189	3675	.1745797	3476	.0757492	6531	190 57 90.0	37.3	+0.00	998269	
4.5	.9795062	5570	.1822966	6646	.0790976	0018	191 27 65.6	12.8	-0.05	997656	
5.0	-.9776218	6738	-.1900002	7684	-.0824404	3449	191 56 101.7	48.9	-0.09	997043	
5.5	.9756628	9180	.1976902	4586	.0857771	6819	192 26 78.4	25.5	0.13	996429	
6.0	.9736322	6896	.2053658	1344	.0891076	0127	192 56 55.7	2.8	0.16	995816	
6.5	.97152.2	5888	.2130266	7954	.0924317	3371	193 25 93.6	40.6	0.18	995202	
7.0	.9693538	4156	.2206718	4408	.0957490	6547	193 55 72.0	19.0	0.19	994588	
7.5	-.9671061	1701	-.2283008	0700	-.0990593	9653	194 34 111.1	58.0	-0.19	993973	
8.0	.9647862	8524	.2359132	6827	.1023622	2686	194 54 90.6	37.5	0.18	993357	
8.5	.9623943	4627	.2435084	2781	.1056575	5642	195 24 70.8	17.6	0.18	992740	
9.0	.9599305	-0011	.2510855	3855	.1089450	8521	195 53 111.5	58.3	0.17	992123	
9.5	.9573949	4677	.2586443	4146	.1122245	1319	196 23 92.7	39.4	0.14	991504	
10.0	-.9547876	8626	-.2661838	9544	-.1154957	4035	196 53 74.5	21.2	-0.11	990886	
10.5	.9521088	1860	.2737037	4747	.1187581	6662	197 23 56.8	3.4	0.07	990266	
11.0	.9493587	4381	.2812032	9746	.1220117	9202	197 52 99.7	46.3	-0.03	989646	
11.5	.9465375	6191	.2886817	4535	.1252562	1651	198 22 83.1	29.6	+0.02	989025	
12.0	.9436452	7289	.2961385	9108	.1284912	4005	198 52 67.1	13.6	0.07	988403	
12.5	-.9406823	7632	-.3035730	3457	-.1317167	6264	199 21 111.5	57.9	+0.13	987780	
13.0	.9376488	7369	.3109846	7578	.1349322	8423	199 51 96.5	42.9	0.19	987157	
13.5	.9345449	6352	.3183727	1464	.1381376	0481	200 21 82.0	28.3	0.25	986532	
14.0	.9313711	4636	.3257368	5110	.1413325	2434	200 51 67.9	14.2	0.32	985908	
14.5	.9281273	2220	.3330763	3510	.1445167	4280	201 21 54.4	0.6	0.38	985282	
15.0	-.9248140	9108	-.3403906	1658	-.1476901	6019	201 50 101.2	47.4	+0.45	984657	
15.5	.9214313	5303	.3476793	4550	.1508522	7644	202 20 88.6	34.7	0.42	984031	
16.0	.9179795	-0866	.3549416	7179	.1540030	9157	202 50 76.3	22.4	0.58	983405	
16.5	.9144588	5621	.3621769	3638	.1571421	0552	203 20 64.6	10.6	0.64	982779	
17.0	.9108636	9750	.3693847	1622	.1602693	1829	203 49 113.2	50.2	0.70	982153	
17.5	-.9072121	3197	-.3765646	3427	-.1633844	2985	204 19 102.4	48.3	+0.76	981527	
18.0	.9034866	5963	.3837158	4945	.1664870	4016	204 49 91.9	37.8	0.81	980902	
18.5	.8996935	8054	.3908380	6173	.1695769	4920	205 19 81.9	27.7	0.85	980278	
19.0	.8958333	9470	.3979303	7103	.1726540	5696	205 49 72.3	18.1	0.89	979656	
19.5	.8919055	-0217	.4049924	7731	.1757179	6340	206 19 63.2	8.9	0.93	979035	
20.0	-.8879113	-0296	-.4120238	8052	-.1787687	6853	206 49 54.4	0.1	+0.96	978415	
20.5	.8838507	9711	.4190240	8961	.1818059	7230	207 18 106.2	51.4	0.98	977796	
21.0	.8797239	8464	.4259926	7754	.1848294	7470	207 48 98.3	43.9	0.99	977180	
21.5	.8755313	6559	.4328990	7125	.1878389	7570	208 18 90.9	36.4	0.99	976566	
22.0	.8712732	3999	.4398326	6169	.1908343	7530	208 48 83.9	29.4	0.98	975954	
22.5	-.8669501	-0781	-.4467030	4880	-.1938152	7344	209 18 77.4	22.8	+0.98	975345	
23.0	.8625621	6930	.4535394	3252	.1967815	7013	209 48 71.1	16.5	0.97	974730	
23.5	.8581096	2426	.4603416	1282	.1997330	6534	210 18 65.6	10.9	0.94	974135	
24.0	.8535924	7279	.4671090	8964	.2026694	5904	210 48 60.3	5.6	0.91	973534	
24.5	.8490122	1494	.4738413	6295	.2055906	5122	211 18 55.5	0.7	0.87	972937	
25.0	-.8443678	5071	-.4805377	3267	-.2084964	4186	211 47 111.1	56.3	+0.83	972343	
25.5	.8396612	8016	.4871981	3679	.2113865	3093	212 17 107.2	52.3	0.77	971751	
26.0	.8348896	-0330	.4938217	6124	.2142608	1842	212 47 103.8	48.9	0.71	971163	
26.5	.8300564	2019	.5004083	1999	.2171189	0429	213 17 100.8	45.8	0.65	970579	
27.0	.8251608	3083	.5069573	7499	.2199608	8854	213 47 98.4	43.4	0.59	969999	
27.5	-.8202033	3520	-.5134684	2619	-.2227662	7114	214 17 96.4	41.3	+0.53	969422	
28.0	.8151840	3356	.5199409	7354	.2255948	5207	214 47 95.0	39.9	0.47	968848	
28.5	.8101035	2572	.5263744	1698	.2283865	3130	215 17 94.0	38.8	0.40	968278	
29.0	.8049618	-1175	.5327683	5647	.2311610	0882	215 47 93.6	38.4	0.34	967712	
29.5	.7997594	9172	.5391223	9197	.2339182	8460	216 17 93.6	38.3	0.27	967149	
30.0	-.7944967	6565	-.5454357	2341	-.2366578	5863	216 47 94.2	38.9	+0.21	966590	
30.5	.7891738	3357	.5517084	5078	.2393797	3089	217 17 95.2	39.8	0.16	966034	
31.0	.7837913	9552	.5579394	7399	.2420835	0134	217 47 96.8	41.4	0.11	965482	
31.5	.7783493	5152	.5641987	9302	.2447692	6098	218 17 98.9	43.4	0.06	964933	
Nov. 1.0	.7728482	-0161	.5702755	0781	.2474365	3678	218 47 101.5	45.9	+0.02	964388	
1.5	-.7672884	4583	-.5763795	1832	-.2500852	0172	219 17 104.7	49.0	-0.02	963845	

(C) The first figures of this and the following logarithms are 9.9.

390 SUN'S COÖRDINATES, 1863.

Date, 1863.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	
Nov. 2.0	—7616702	8420	—5824403	2451	—2527151	6478	219° 47' 108.4	52.7	—0.06	963306	
2.5	7559041	1678	5884572	2631	2553260	2594	220 17 112.7	56.9	0.09	962770	
3.0	7552604	4360	5944239	2370	2579176	8517	220 48 57.5	1.7	0.11	962237	
3.5	7444644	6469	6003577	1659	2604896	4244	221 18 62.8	6.9	0.12	961706	
4.0	7386217	8011	6062402	0496	2630420	5776	221 48 68.7	12.8	0.13	961178	
4.5	—7327174	8987	—6123768	8874	—2655743	5106	222 18 75.0	19.0	—0.12	960651	
5.0	7267572	9404	6178670	6788	2680865	0236	222 48 81.9	25.9	0.11	960127	
5.5	7217412	9263	6236133	4233	2705781	5159	223 18 89.2	33.1	0.09	959606	
6.0	7146700	8570	6293063	1205	2730493	5979	223 48 97.1	40.9	0.07	959087	
6.5	7085440	7329	6349546	7700	2754997	4390	224 18 105.4	49.1	—0.04	958570	
7.0	—7023636	5543	—6406544	3711	—2779291	8692	224 48 114.3	58.0	0.00	958055	
7.5	6961293	3219	6461055	5924	2803374	2783	225 19 63.6	7.2	+0.04	957541	
8.0	6898416	3069	6516074	4266	2827243	6660	225 49 73.5	17.1	0.09	957030	
8.5	6835008	6371	6570507	8802	2850896	0321	226 19 83.8	27.3	0.14	956520	
9.0	6771077	3058	6624615	2833	2874331	3764	226 49 94.6	38.1	0.20	956013	
9.5	—6706625	8625	—6678126	6348	—2897545	6986	227 19 105.9	49.3	+0.26	955507	
10.0	6641658	3676	6731124	5970	2920537	5986	227 50 57.5	0.8	0.33	955003	
10.5	6576181	8217	6783637	1867	2943305	2762	228 20 69.6	12.8	0.40	954501	
11.0	6510198	2252	6835567	3841	2965847	5312	228 50 82.1	25.2	0.48	954001	
11.5	6443716	5788	6887005	5293	2988161	7634	229 20 95.0	38.0	0.55	953502	
12.0	—6376741	8830	—6937912	6214	—3010245	5727	229 50 108.3	51.3	+0.62	953006	
12.5	6309277	1384	6988287	6603	3032098	1588	230 21 62.0	4.9	0.69	952511	
13.0	6241323	3453	7038124	6455	3053718	3217	230 51 76.1	19.0	0.75	952019	
13.5	6172303	5045	7087420	5765	3075104	4611	231 21 90.5	33.3	0.80	951520	
14.0	6104006	6165	7136169	4529	3096254	5770	231 51 105.3	48.1	0.85	951041	
14.5	—6034643	6820	—7184369	2744	—3117165	6689	232 22 60.4	3.1	+0.90	950555	
15.0	5964819	7013	7232015	0406	3137836	7360	232 52 75.8	18.4	0.94	950073	
15.5	5894540	6751	7279104	7510	3158265	7806	233 22 91.6	34.1	0.97	949583	
16.0	5823811	6039	7325632	4054	3178451	8001	233 52 107.7	50.1	1.00	949117	
16.5	5752638	4883	7371595	0032	3198391	7950	234 23 64.1	6.4	1.02	948644	
17.0	—5681026	3287	—7416990	5443	—3218086	7654	234 53 80.9	23.2	+1.03	948175	
17.5	5608981	1259	7461814	0283	3237532	7109	235 23 97.9	40.1	1.03	947709	
18.0	5536539	8803	7506363	4548	3256728	6314	235 53 115.3	57.5	1.03	947247	
18.5	5463615	5925	7549733	8234	3275674	5269	236 24 73.0	15.1	1.02	946788	
19.0	5390306	2632	7592818	1335	3294367	3971	236 54 91.0	33.0	1.00	946334	
19.5	—5316588	8930	—7635319	3852	—3312908	9421	237 24 109.3	51.2	+0.98	945884	
20.0	5242464	4822	7677232	5782	3330994	0616	237 55 67.8	9.6	0.95	945439	
20.5	5167942	3016	7718556	7123	3348925	8556	238 25 86.7	28.4	0.91	944999	
21.0	5093026	5416	7759286	7870	3366600	6240	238 55 105.8	47.4	0.87	944564	
21.5	5017723	0129	7799421	8022	3384017	3666	239 26 65.2	6.7	0.82	944134	
22.0	—4942038	4459	—7838957	7585	—3401175	0833	239 56 84.9	26.4	+0.77	943709	
22.5	4865977	8414	7877892	6537	3418072	7730	240 26 104.9	46.3	0.71	943289	
23.0	4789544	1906	7916223	4886	3434707	4383	240 57 65.3	6.7	0.65	942875	
23.5	4712746	5213	7953949	2629	3451078	0763	241 27 85.9	27.2	0.59	942466	
24.0	4635589	8071	7991065	5763	3467184	6879	241 57 106.9	48.2	0.53	942064	
24.5	—4558178	50575	—8027569	6285	—3483024	9728	242 28 68.2	9.4	+0.47	941667	
25.0	4483217	2728	8063458	2192	3498597	8311	242 58 80.8	30.9	0.40	941276	
25.5	4402314	4540	8098729	7482	3513901	3624	243 28 111.8	52.8	0.34	940891	
26.0	4323473	6113	8133378	2140	3528936	8669	243 59 74.0	14.9	0.27	940512	
26.5	4244601	7155	8167404	6185	3543700	3442	244 29 96.6	37.5	0.20	940139	
27.0	—4165402	7970	—8200893	5603	—3558193	7945	245 0 59.5	0.3	+0.14	939772	
27.5	4085882	8464	823574	2393	3572414	2175	245 30 82.7	23.4	0.09	939411	
28.0	4006346	8642	8265713	4551	3586361	6132	246 0 106.3	47.0	+0.04	939056	
28.5	3925900	8510	8297219	6076	3600034	5814	246 31 70.2	10.8	0.00	938707	
29.0	3845451	8074	8328087	6064	3613431	3221	247 1 94.5	35.0	—0.04	938364	
29.5	—3764703	7340	—8358317	7213	—3626551	6851	247 31 119.1	59.5	—0.07	938026	
30.0	3683661	6311	8387904	6280	3639392	9202	248 2 84.1	24.4	0.09	937694	
30.5	3602332	4995	8416847	5783	3651953	1773	248 32 109.4	49.6	0.10	937367	
Dec. 1.0	3520722	3377	8445142	4098	3664232	4062	249 3 75.1	15.2	0.11	937046	
1.5	3438837	1525	8472787	1763	3676228	6063	249 33 101.1	41.1	0.11	936730	
2.0	—3356683	9383	—8499780	8777	—3687940	7790	250 4 67.5	7.5	—0.10	936419	

SUN'S COÖRDINATES, 1863. 391

Date, 1863.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	ρ
Dec. 2.5	—3974266	6978	—8596117	5134	—3699368	9228	250° 34' 04.2	34.1	—0.08	0.06	936113
3.0	3191591	4315	8551795	0833	3710509	0379	251 5 61.3	1.2	0.06	0.06	935811
3.5	3109664	1400	8576813	5872	3721362	1242	251 35 88.7	28.5	—0.03	0.03	935514
4.0	3025493	8240	8601168	0248	3731926	1817	252 5 116.5	56.2	0.00	0.00	935222
4.5	2942083	4841	8624858	3959	3742201	2102	252 36 84.5	24.1	+0.04	0.04	934934
5.0	—2358442	1211	—8647880	7002	—3752185	2007	253 6 112.9	52.4	+0.08	0.08	934651
5.5	2774575	7356	8670232	9375	3761879	1801	253 37 61.6	21.0	0.13	0.13	934372
6.0	2680491	3282	8691912	1077	3771290	1213	254 7 110.6	49.9	0.19	0.19	934097
6.5	2616195	8907	8712917	2103	3780389	0332	254 38 80.0	19.2	0.25	0.25	933826
7.0	2521694	4506	8733246	3454	3789204	9158	255 8 109.5	48.7	0.31	0.31	933559
7.5	—2436904	9817	—8752896	2126	—3797725	7680	255 39 79.4	18.5	+0.37	0.37	933286
8.0	2352105	4938	8771865	1117	3805951	5226	256 9 109.4	48.5	0.44	0.44	933037
8.5	2267031	9874	8790151	9425	3813881	3867	256 40 79.8	18.8	0.50	0.50	932781
9.0	2181779	4632	8807752	7049	3821514	1511	257 10 110.3	49.2	0.58	0.58	932530
9.5	2096356	9218	8824667	3986	3828849	8857	257 41 81.1	19.9	0.64	0.64	932282
10.0	—2010769	3640	—8840894	0236	—3835886	5005	258 11 112.2	50.9	+0.70	0.70	932038
10.5	1925025	7904	8856432	5796	3842625	2655	258 42 83.5	22.1	0.76	0.76	931797
11.0	1839130	2017	8871279	0666	3849065	9106	259 12 115.0	53.5	0.82	0.82	931560
11.5	1753093	5980	8885435	4845	3855205	5257	259 43 86.6	25.0	0.87	0.87	931327
12.0	1666919	9823	8898838	8331	3861043	1106	260 13 118.5	56.9	0.91	0.91	931098
12.5	—1580616	3528	—8911668	1124	—3866580	6654	260 44 90.4	28.7	+0.95	0.95	930873
13.0	1494192	7112	8928744	3223	3871817	1902	261 15 62.5	0.8	0.99	0.99	930652
13.5	1417654	0582	8935123	4625	3876753	6849	261 44 94.7	32.9	1.01	1.01	930435
14.0	1321009	3944	8945805	5330	3881387	1494	262 16 67.0	5.1	1.03	1.03	930222
14.5	1234265	7207	8955789	5337	3886717	5835	262 46 99.5	37.5	1.03	1.03	930014
15.0	—1147430	0378	—8965075	4646	—3889744	0873	263 17 72.0	9.9	+1.03	1.03	929810
15.5	1060510	3464	8973661	3255	3893469	2609	263 47 104.7	42.5	1.02	1.02	929610
16.0	0973512	6492	8981549	1166	3896893	7044	264 18 77.4	15.1	1.01	1.01	929416
16.5	0886444	9410	8988737	8377	3900013	0175	264 48 110.2	47.8	0.99	0.99	929226
17.0	0799308	2280	8995225	4889	3902830	3003	265 19 83.0	20.6	0.96	0.96	929042
17.5	—0712116	5094	—9001014	0701	—3905343	5527	265 49 116.0	53.5	+0.93	0.93	928862
18.0	0624871	7855	9006103	5814	3907552	7747	266 20 88.9	26.3	0.89	0.89	928688
18.5	0537581	0570	9010493	0228	3909459	9665	266 50 122.0	59.3	0.84	0.84	928519
19.0	0450253	3247	9014182	3941	3911062	1279	267 21 95.1	32.3	0.79	0.79	928357
19.5	0362294	5893	9017173	6954	3912862	2590	267 52 68.3	5.4	0.73	0.73	928201
20.0	—0275511	8515	—9019463	9270	—3913359	3598	268 22 101.5	38.5	+0.67	0.67	928052
20.5	0188110	1119	9021054	0885	3914053	4302	268 53 74.8	11.7	0.61	0.61	927910
21.0	0100698	3711	9021947	1802	3914443	4703	269 23 108.1	44.9	0.54	0.54	927774
21.5	—0013280	6297	—9022141	2020	3914530	4800	269 54 81.5	18.2	0.47	0.47	927645
22.0	+0074135	1114	9021636	1540	3914314	4595	270 24 114.9	51.6	0.40	0.40	927522
22.5	+0161543	8518	9020433	0361	3913795	4086	270 55 88.4	25.0	+0.33	0.33	927405
23.0	0248937	5908	9018532	8485	3912974	3276	271 25 121.9	58.4	0.26	0.26	927296
23.5	0336310	3277	9015933	5010	3911849	2162	271 56 96.6	32.0	0.20	0.20	927193
24.0	0423655	0619	9012636	2638	3910421	0745	272 27 69.2	5.5	0.14	0.14	927098
24.5	0510967	7928	9008642	8668	3908691	9026	272 57 103.0	39.2	0.08	0.08	927010
25.0	+0508239	5197	9003950	4001	3906659	7005	273 28 76.7	12.8	+0.03	0.03	926929
25.5	0685466	2422	8998560	8636	3904324	4681	273 58 110.6	46.6	—0.02	0.02	926855
26.0	0772640	9594	8992475	2576	3901686	2054	274 29 84.5	20.4	0.06	0.06	926789
26.5	0859757	6700	8986692	5818	3898746	9125	274 59 118.6	54.4	0.09	0.09	926730
27.0	0946807	3757	8978214	8262	3895503	5893	275 30 92.6	28.4	0.12	0.12	926677
27.5	+1033787	0735	8970689	0216	3891958	2359	276 1 66.9	2.6	—0.14	0.14	926631
28.0	1120688	7635	8961171	1374	3888111	8523	276 31 101.1	36.7	0.15	0.15	926592
28.5	1217596	4452	8951607	1835	3883962	4385	277 2 75.5	11.0	0.15	0.15	926560
29.0	1304232	1177	8941349	1603	3879511	9944	277 32 109.9	45.3	0.15	0.15	926534
29.5	1380861	7806	8930397	0676	3834758	5202	278 3 84.5	19.8	0.14	0.14	926516
30.0	+1467386	4329	8918752	9057	3869705	0159	278 33 119.0	54.2	—0.13	0.13	926504
30.5	1553801	0743	8906414	6745	3864350	4815	279 4 93.7	28.8	0.11	0.11	926498
31.0	1640098	7040	8893384	3741	3858695	9170	279 35 68.4	3.4	0.08	0.08	926498
31.5	1726273	3215	8879662	0045	3852739	3224	280 5 103.3	38.2	—0.04	0.04	926504
32.0	+1812315	9257	8865250	5659	3846483	6979	280 36 78.2	13.0	0.00	0.00	926515

392 HELIOCENTRIC COORDINATES.

MERCURY.								
Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2}x$.	$-\frac{y^2}{r^2}y$.	$-\frac{z^2}{r^2}z$.
1505	+0.1766	-0.4019	-0.0496	9.6451	293 52.6	-2.00	+ 4.54	+0.56
1510	0.2681	0.3202	0.0509	9.6239	309 59.6	3.51	4.18	0.67
1515	0.3328	0.2070	0.0472	9.5964	328 1.9	5.26	3.27	0.75
1520	0.3574	-0.0696	0.0378	9.5636	348 46.9	7.09	+ 1.38	0.75
1525	0.3286	+0.0773	0.0228	9.5293	13 2.6	8.26	- 1.34	0.57
1530	0.2383	0.2087	-0.0037	9.5008	41 10.6	7.30	6.39	+0.11
1535	+0.0947	0.2022	+0.0162	9.4880	72 12.9	-3.17	9.77	-0.54
1540	-0.0721	0.3038	0.0321	9.4968	103 33.1	+2.27	9.56	1.01
1545	0.2230	0.2447	0.0405	9.5231	132 22.3	5.85	6.42	1.06
1550	0.3310	0.1370	0.0411	9.5570	157 22.7	6.87	2.84	0.85
1555	0.3877	+0.0071	0.0352	9.5904	178 44.6	6.39	- 0.12	0.58
1560	0.3962	-0.1243	0.0249	9.6191	197 14.3	5.36	+ 1.68	0.34
1565	0.3641	0.2434	+0.0120	9.6416	213 40.0	4.21	2.82	-0.14
1570	0.2999	0.3412	-0.0020	9.6573	228 42.5	3.11	3.54	+0.02
1575	0.2120	0.4123	0.0158	9.6664	242 54.7	2.07	4.02	0.15
1580	-0.1083	0.4530	0.0285	9.6690	256 44.2	+1.04	4.34	0.27
1585	+0.0032	0.4608	0.0391	9.6650	270 36.5	-0.03	4.53	0.39
1590	0.1143	0.4341	0.0468	9.6545	284 56.9	1.21	4.59	0.50
1595	0.2162	0.3727	0.0507	9.6373	300 14.2	2.58	4.44	0.60
1600	0.2983	0.2777	0.0501	9.6135	317 2.7	4.19	3.90	0.70
1605	0.3484	0.1535	0.0441	9.5835	336 5.0	6.02	2.65	0.76
1610	0.3528	-0.0099	0.0324	9.5496	358 10.3	7.71	+ 0.22	0.71
1615	0.2993	+0.1343	-0.0154	9.5165	24 1.0	8.22	- 3.67	+0.42
1620	0.1851	0.2502	+0.0046	9.4931	53 32.9	5.97	8.07	-0.16
1625	+0.0275	0.3062	0.0234	9.4889	85 5.1	-0.91	10.17	0.78
1630	-0.1373	0.2874	0.0365	9.5059	115 40.5	+4.06	8.49	1.08
1635	0.2728	0.2052	0.0417	9.5365	143 0.1	6.53	4.91	1.00
1640	0.3602	+0.0855	0.0394	9.5709	166 27.4	6.79	- 1.65	0.75
1645	0.3966	-0.0471	0.0315	9.6028	186 33.2	6.00	+ 0.71	0.48
1650	0.3876	0.1748	0.0199	9.6290	204 7.1	4.89	2.21	0.25
1655	0.3414	0.2861	+0.0064	9.6488	219 54.6	3.76	3.15	-0.07
1660	0.2666	0.3736	-0.0077	9.6618	234 33.0	2.68	3.76	+0.08
1665	0.1713	0.4327	0.0212	9.6683	248 32.8	1.65	4.17	0.20
1670	-0.0635	0.4603	0.0331	9.6682	262 20.5	+0.61	4.43	0.32
1675	+0.0488	0.4541	0.0426	9.6616	276 21.0	-0.49	4.58	0.43
1680	0.1574	0.4133	0.0489	9.6483	291 0.8	1.74	4.57	0.54
1685	0.2526	0.3380	0.0510	9.6284	306 50.6	3.20	4.28	0.65
1690	0.3233	0.2304	0.0483	9.6020	324 27.8	4.92	3.51	0.73
1695	0.3565	-0.0967	0.0400	9.5700	344 38.4	6.76	+ 1.84	0.76
1700	0.3386	+0.0500	0.0260	9.5356	8 11.5	8.15	- 1.20	0.63
1705	0.2599	0.1867	-0.0075	9.5052	35 37.1	7.71	5.54	+0.22
1710	+0.1246	0.2816	+0.0126	9.4888	66 16.3	-4.14	9.36	-0.42
1715	-0.0409	0.3074	0.0296	9.4935	97 47.5	+1.32	9.89	0.95
1720	0.1974	0.2603	0.0396	9.5173	127 14.4	5.39	7.11	1.08
1725	0.3146	0.1596	0.0416	9.5505	152 58.9	6.83	3.47	0.90
1730	0.3810	+0.0321	0.0367	9.5844	174 58.7	6.54	- 0.55	0.63
1735	0.3980	-0.1003	0.0271	9.6142	193 56.9	5.56	+ 1.40	0.38
1740	0.3728	0.2224	0.0146	9.6379	210 42.5	4.43	2.64	0.17
1745	0.3140	0.3247	+0.0007	9.6549	225 57.8	3.32	3.43	-0.01
1750	0.2299	0.4013	-0.0133	9.6652	240 17.2	2.26	3.94	+0.13
1755	0.1246	0.4478	0.0263	9.6690	254 9.1	1.23	4.29	0.25
1760	-0.0180	-0.4619	-0.0373	9.6663	267 58.9	+0.18	+ 4.51	+0.36

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

HELIOCENTRIC COÖRDINATES. 393

MERCURY.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2} x$.	$-\frac{x^2}{r^2} y$.	$-\frac{x^2}{r^2} z$.
1765	+0.0939	-0.4418	-0.0456	9.6570	282 12.0	-0.98	+ 4.60	+0.47
1770	0.1983	0.3869	0.0503	9.6411	297 16.2	2.30	4.49	0.58
1775	0.2850	0.2980	0.0506	9.6184	313 44.6	3.87	4.05	0.69
1780	0.3421	0.1787	0.0456	9.5896	332 18.2	5.67	2.96	0.78
1785	0.3561	-0.0377	0.0350	9.5561	353 45.4	7.44	+ 0.79	0.76
1790	0.3141	+0.1084	-0.0189	9.5223	18 51.9	8.29	- 2.86	+0.50
1795	0.2107	0.2322	+0.0008	9.4963	47 46.6	6.65	7.33	-0.02
1800	+0.0589	0.3013	0.0201	9.4880	79 8.8	-1.97	10.07	0.67
1805	-0.1077	0.2964	0.0346	9.5014	110 8.3	+3.28	9.03	1.05
1810	0.2508	0.2243	0.0413	9.5302	138 10.4	6.26	5.60	1.03
1815	0.3478	+0.1096	0.0403	9.5645	162 20.1	6.85	- 2.16	0.79
1820	0.3935	-0.0221	0.0333	9.5972	183 0.1	6.19	+ 0.35	0.52
1825	0.3924	0.1518	0.0223	9.6246	200 58.7	5.11	1.97	0.29
1830	0.3525	0.2668	+0.0090	9.6456	217 3.0	3.97	3.00	-0.10
1835	0.2824	0.3592	-0.0051	9.6599	231 51.9	2.88	3.66	+0.05
1840	0.1904	0.4239	0.0187	9.6675	245 56.9	1.84	4.10	0.18
1845	-0.0844	0.4575	0.0310	9.6687	259 44.9	+0.81	4.39	0.30
1850	+0.0278	0.4579	0.0411	9.6633	273 41.1	-0.28	4.56	0.41
1855	0.1377	0.4236	0.0480	9.6513	288 11.4	1.49	4.58	0.52
1860	0.2362	0.3547	0.0510	9.6327	303 45.4	2.91	4.37	0.63
1865	0.3125	0.2528	0.0492	9.6074	320 59.2	4.58	3.71	0.72
1870	0.3538	-0.1233	0.0420	9.5764	340 37.1	6.42	+ 2.24	0.76
1875	+0.3464	+0.0224	-0.0290	9.5420	3 28.9	-7.98	- 0.52	+0.67

VENUS.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2} x$.	$-\frac{x^2}{r^2} y$.	$-\frac{x^2}{r^2} z$.
1505	+0.2490	-0.6836	-0.0245	9.8621	290 0.2	- 7.83	+21.51	+0.77
1510	0.3406	0.6429	0.0291	9.8622	297 54.5	10.73	20.21	0.91
1515	0.4258	0.5899	0.0332	9.8623	305 48.7	13.38	18.54	1.04
1520	0.5027	0.5256	0.0367	9.8623	313 42.8	15.80	16.52	1.15
1525	0.5699	0.4513	0.0395	9.8622	321 36.9	17.93	14.19	1.24
1530	0.6260	0.3683	0.0415	9.8621	329 31.3	19.72	11.59	1.30
1535	0.6705	0.2783	0.0427	9.8619	337 26.0	21.14	8.77	1.34
1540	0.7026	0.1829	0.0430	9.8617	345 21.1	22.17	5.77	1.36
1545	0.7210	-0.0840	0.0426	9.8615	353 16.8	22.78	+ 2.66	1.35
1550	0.7250	+0.0164	0.0414	9.8612	1 12.9	22.95	- 0.52	1.31
1555	0.7153	0.1167	0.0393	9.8608	9 10.0	22.71	3.70	1.25
1560	0.6917	0.2146	0.0365	9.8604	17 7.9	22.02	6.83	1.16
1565	0.6548	0.3083	0.0330	9.8600	25 6.5	20.91	9.84	1.05
1570	0.6052	0.3961	0.0288	9.8596	33 5.9	19.38	12.68	0.92
1575	0.5442	0.4762	0.0241	9.8592	41 6.5	17.46	15.29	0.77
1580	0.4722	0.5469	0.0189	9.8588	49 7.7	15.18	17.61	0.61
1585	0.3903	0.6070	0.0133	9.8584	57 9.9	12.60	19.60	0.43
1590	0.3012	0.6551	0.0075	9.8580	65 13.1	9.76	21.21	0.24
1595	0.2067	0.6904	-0.0015	9.8577	73 17.0	6.71	22.40	+0.05
1600	0.1082	0.7119	+0.0045	9.8573	81 21.8	3.49	23.16	-0.14
1605	+0.0067	0.7195	0.0104	9.8570	89 27.2	- 0.21	23.45	0.34
1610	-0.0948	0.7127	0.0161	9.8568	97 33.2	+ 3.10	23.27	0.53
1615	-0.1942	+0.6917	+0.0215	9.8566	105 39.7	+ 6.35	-22.61	-0.71

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

394 HELIOCENTRIC COÖRDINATES.

VENUS.								
Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{y^2}{r^3}y$.	$-\frac{z^2}{r^3}z$.
1620	-0.2896	+0.6571	+0.0264	9.8565	113 46.6	+ 9.47	-21.49	-0.86
1625	0.3794	0.6093	0.0308	9.8564	121 53.7	12.42	19.94	1.01
1630	0.4615	0.5494	0.0347	9.8564	130 1.0	15.11	17.99	1.14
1635	0.5345	0.4786	0.0378	9.8564	138 8.3	17.49	15.66	1.24
1640	0.5968	0.3982	0.0402	9.8565	146 15.4	19.52	13.03	1.31
1645	0.6468	0.3099	0.0418	9.8566	154 22.3	21.16	10.13	1.37
1650	0.6843	0.2155	0.0425	9.8568	162 28.7	22.35	7.03	1.39
1655	0.7087	0.1167	0.0424	9.8571	170 34.6	23.09	3.80	1.38
1660	0.7187	+0.0156	0.0415	9.8574	178 39.9	23.37	- 0.51	1.34
1665	0.7144	-0.0857	0.0397	9.8577	186 44.6	23.18	+ 2.78	1.29
1670	0.6960	0.1854	0.0372	9.8581	194 48.4	22.52	6.00	1.20
1675	0.6639	0.2814	0.0339	9.8585	202 51.4	21.42	9.08	1.09
1680	0.6187	0.3719	0.0299	9.8589	210 53.5	19.93	11.98	0.97
1685	0.5615	0.4551	0.0254	9.8593	218 54.7	18.02	14.62	0.82
1690	0.4933	0.5294	0.0204	9.8597	226 55.0	15.78	16.94	0.65
1695	0.4155	0.5935	0.0150	9.8601	234 54.3	13.26	18.93	0.48
1700	0.3296	0.6460	0.0093	9.8605	242 52.8	10.49	20.55	0.29
1705	0.2374	0.6860	+0.0034	9.8609	250 50.5	7.53	21.77	-0.11
1710	0.1405	0.7127	-0.0026	9.8612	258 47.3	4.45	22.52	+0.08
1715	-0.0409	0.7258	0.0085	9.8615	266 43.5	+ 1.29	22.94	0.27
1720	+0.0594	0.7248	0.0142	9.8618	274 39.0	- 1.87	22.86	0.45
1725	0.1586	0.7100	0.0197	9.8620	282 34.0	4.99	22.36	0.62
1730	0.2548	0.6814	0.0248	9.8621	290 28.7	8.02	21.44	0.78
1735	0.3461	0.6400	0.0294	9.8622	298 23.0	10.88	20.13	0.93
1740	0.4307	0.5863	0.0335	9.8623	306 17.2	13.53	18.42	1.05
1745	0.5072	0.5213	0.0369	9.8623	314 11.3	15.94	16.38	1.16
1750	0.5739	0.4464	0.0396	9.8622	322 5.5	18.04	14.04	1.25
1755	0.6297	0.3630	0.0416	9.8621	329 59.9	19.82	11.42	1.31
1760	0.6733	0.2725	0.0427	9.8619	337 54.6	21.22	8.58	1.35
1765	0.7042	0.1765	0.0430	9.8617	345 49.7	22.22	5.57	1.36
1770	0.7214	-0.0779	0.0426	9.8614	353 45.4	22.81	+ 2.46	1.35
1775	0.7248	+0.0227	0.0412	9.8611	1 41.7	22.97	- 0.72	1.31
1780	0.7142	0.1227	0.0391	9.8608	9 38.7	22.68	3.00	1.24
1785	0.6899	0.2205	0.0363	9.8604	17 36.5	21.97	7.62	1.16
1790	0.6521	0.3139	0.0327	9.8600	25 35.2	20.82	10.02	1.04
1795	0.6017	0.4013	0.0285	9.8596	33 34.7	19.27	12.85	0.91
1800	0.5396	0.4808	0.0238	9.8592	41 35.2	17.32	15.44	0.76
1805	0.4669	0.5509	0.0186	9.8588	49 36.7	15.04	17.73	0.60
1810	0.3851	0.6103	0.0130	9.8584	57 38.9	12.43	19.70	0.42
1815	0.2958	0.6577	0.0071	9.8580	65 41.9	9.58	21.29	0.23
1820	0.2006	0.6926	-0.0012	9.8577	73 45.9	6.51	22.47	0.04
1825	0.1014	0.7133	+0.0048	9.8573	81 50.7	3.30	23.21	-0.15
1830	+0.0002	0.7199	0.0107	9.8570	89 56.1	- 0.01	23.47	0.25
1835	-0.1009	0.7122	0.0164	9.8568	98 2.1	+ 3.30	23.25	0.54
1840	0.2001	0.6901	0.0218	9.8566	106 8.6	6.54	22.56	0.71
1845	0.2953	0.6546	0.0267	9.8565	114 15.5	9.66	21.41	0.87
1850	0.3846	0.6061	0.0311	9.8564	122 22.5	12.59	19.84	1.02
1855	0.4662	0.5455	0.0349	9.8564	130 29.8	15.26	17.86	1.14
1860	0.5386	0.4740	0.0380	9.8564	138 37.0	17.62	15.52	1.24
1865	0.6002	0.3931	0.0403	9.8565	146 44.1	19.63	12.86	1.32
1870	-0.6499	+0.3044	+0.0418	9.8566	154 50.9	+21.24	- 9.36	-1.37

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

HELIOCENTRIC COÖRDINATES. 395

THE EARTH.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
1500	-0.0630	+0.9813	0.0000	9.9927	93 40.4	+ 0.89	-13.77	0.00
1510	0.2360	0.9545		9.9927	103 52.1	3.34	13.37	
1520	0.4009	0.8983		9.9929	114 3.1	5.62	12.59	
1530	0.5539	0.8141		9.9933	124 13.6	7.74	11.38	
1540	0.6898	0.7048		9.9939	134 22.8	9.60	9.81	
1550	0.8042	0.5738		9.9947	144 29.9	11.13	7.94	
1560	0.8941	0.4251		9.9956	154 34.6	12.30	5.85	
1570	0.9568	0.2635		9.9967	164 36.3	13.06	3.60	
1580	0.9907	+0.0939		9.9979	174 35.0	13.41	- 1.97	
1590	0.9949	-0.0785		9.9991	184 30.5	13.36	+ 1.06	
1600	0.9695	0.2485		0.0004	194 22.5	12.90	3.31	
1610	0.9156	0.4111		0.0016	204 11.1	12.08	5.42	
1620	0.8350	0.5618		0.0028	213 56.5	10.93	7.35	
1630	0.7301	0.6963		0.0039	223 38.7	9.49	9.06	
1640	0.6042	0.8109		0.0049	233 18.2	7.80	10.48	
1650	0.4612	0.9023		0.0057	242 55.3	5.92	11.58	
1660	0.3051	0.9679		0.0063	252 30.3	3.90	12.36	
1670	-0.1402	1.0061		0.0068	262 3.9	+ 1.78	12.81	
1680	+0.0236	1.0161		0.0071	271 36.4	- 0.37	12.91	
1690	0.1965	0.9976		0.0072	281 8.4	2.50	12.67	
1700	0.3589	0.9511		0.0071	290 40.5	4.56	12.08	
1710	0.5113	0.8777		0.0068	300 13.3	6.51	11.17	
1720	0.6492	0.7797		0.0063	309 46.9	8.29	9.96	
1730	0.7688	0.6597		0.0056	319 22.2	9.87	8.47	
1740	0.8665	0.5208		0.0047	328 59.7	11.19	6.73	
1750	0.9394	0.3671		0.0037	338 39.6	12.22	4.77	
1760	0.9853	0.2029		0.0026	348 22.1	12.94	2.65	
1770	1.0027	-0.0328		0.0014	358 7.8	13.27	+ 0.43	
1780	0.9909	+0.1384		0.0002	7 56.9	13.21	- 1.84	
1790	0.9498	0.3054		9.9990	17 49.4	12.76	4.10	
1800	0.8804	0.4633		9.9977	27 45.2	11.93	6.28	
1810	0.7846	0.6073		9.9965	37 44.3	10.73	8.30	
1820	0.6651	0.7329		9.9955	47 46.6	9.16	10.09	
1830	0.5253	0.8362		9.9946	57 51.7	7.28	11.58	
1840	0.3696	0.9139		9.9938	67 59.1	5.15	12.73	
1850	0.2024	0.9634		9.9932	78 8.4	2.83	13.47	
1860	+0.0289	0.9832		9.9928	88 19.2	- 0.40	13.79	
1870	-0.1457	+0.9724	0.0000	9.9927	98 30.5	+ 2.05	-13.65	0.00

MARS.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
1500	+0.7738	+1.2843	+0.0087	0.1759	58 56.7	-0.41	-0.67	-0.01
1510	0.6565	1.3626	0.0132	0.1796	64 17.3	0.34	0.79	0.01
1520	0.5332	1.4285	0.0177	0.1834	69 32.4	0.27	0.71	0.01
1530	0.4063	1.4832	0.0229	0.1870	74 42.2	0.20	0.72	0.01
1540	0.2758	1.5261	0.0269	0.1906	79 46.8	0.13	0.72	0.01
1550	0.1429	1.5568	0.0299	0.1941	84 46.5	-0.07	0.72	0.01
1560	+0.0090	+1.5751	+0.0335	0.1974	89 41.6	+0.00	-0.71	-0.02

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

396 HELIOCENTRIC COÖRDINATES.

MARS.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
1570	-0.1251	+0.5815	+0.0369	0.2005	94 32.4	+0.06	-0.70	-0.02
1580	0.2580	0.5763	0.0400	0.2035	99 19.2	0.11	0.68	0.02
1590	0.3893	0.5598	0.0428	0.2063	104 2.2	0.17	0.66	0.02
1600	0.5178	0.5322	0.0453	0.2089	108 41.6	0.22	0.64	0.02
1610	0.6426	0.4937	0.0475	0.2112	113 17.8	0.26	0.61	0.02
1620	0.7631	0.4448	0.0494	0.2133	117 51.2	0.31	0.58	0.02
1630	0.8783	0.3862	0.0509	0.2152	122 22.2	0.35	0.55	0.02
1640	0.9876	0.3184	0.0521	0.2169	126 59.9	0.39	0.52	0.02
1650	1.0904	0.2420	0.0530	0.2183	131 17.6	0.43	0.49	0.02
1660	1.1860	0.1574	0.0535	0.2195	135 42.6	0.46	0.45	0.02
1670	1.2739	0.0652	0.0536	0.2204	140 6.5	0.49	0.41	0.02
1680	1.3537	0.9660	0.0534	0.2211	144 29.5	0.52	0.37	0.02
1690	1.4248	0.8607	0.0529	0.2215	148 51.8	0.54	0.33	0.02
1700	1.4867	0.7501	0.0520	0.2216	153 13.8	0.56	0.29	0.02
1710	1.5392	0.6346	0.0508	0.2215	157 35.7	0.58	0.24	0.02
1720	1.5818	0.5151	0.0493	0.2212	161 57.9	0.60	0.20	0.02
1730	1.6142	0.3923	0.0475	0.2205	166 20.7	0.62	0.15	0.02
1740	1.6362	0.2669	0.0453	0.2197	170 44.5	0.63	0.10	0.02
1750	1.6476	0.1396	0.0428	0.2185	175 9.5	0.64	0.05	0.02
1760	1.6481	+0.0115	0.0401	0.2171	179 36.1	0.65	-0.00	0.02
1770	1.6377	-0.1166	0.0371	0.2155	184 4.5	0.65	+0.05	0.02
1780	1.6164	0.2440	0.0339	0.2135	188 35.2	0.65	0.10	0.01
1790	1.5843	0.3698	0.0304	0.2114	193 8.3	0.65	0.15	0.01
1800	1.5414	0.4930	0.0267	0.2091	197 44.2	0.64	0.21	0.01
1810	1.4879	0.6127	0.0229	0.2066	202 23.1	0.63	0.26	0.01
1820	1.4236	0.7281	0.0189	0.2038	207 5.5	0.62	0.32	0.01
1830	1.3490	0.8382	0.0147	0.2009	211 51.7	0.60	0.37	0.01
1840	1.2644	0.9421	0.0104	0.1977	216 41.9	0.57	0.43	0.00
1850	1.1703	1.0389	0.0061	0.1945	221 36.4	0.54	0.48	0.00
1860	1.0672	1.1277	+0.0017	0.1910	226 35.6	0.50	0.53	0.00
1870	-0.9556	-1.2076	-0.0027	0.1875	231 39.6	+0.46	+0.58	-0.00

JUPITER.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
1500	-5.28582	-1.34101	+0.12431	0.73677	194 14 3	+147.15	+37.34	-3.46
1510	5.26758	1.41055	0.12414	0.73676	194 59 22	146.65	39.27	3.45
1520	5.24839	1.47984	0.12395	0.73675	195 44 41	146.13	41.20	3.45
1530	5.22825	1.54886	0.12374	0.73674	196 30 0	145.58	43.13	3.44
1540	5.20716	1.61760	0.12350	0.73672	197 15 19	145.02	45.05	3.44
1550	5.18512	1.68604	0.12325	0.73670	198 0 38	144.43	46.96	3.43
1560	5.16212	1.75417	0.12297	0.73667	198 45 58	143.81	48.87	3.43
1570	5.13818	1.82197	0.12267	0.73664	199 31 18	143.17	50.77	3.42
1580	5.11331	1.88945	0.12235	0.73660	200 16 38	142.51	52.66	3.41
1590	5.08750	1.95659	0.12200	0.73657	201 1 59	141.83	54.54	3.40
1600	5.06076	2.02337	0.12164	0.73653	201 47 21	141.13	56.42	3.39
1610	5.03310	2.08977	0.12124	0.73648	202 32 42	140.40	58.29	3.38
1620	5.00451	2.15579	0.12083	0.73643	203 18 5	139.65	60.15	3.37
1630	-4.97500	-2.22142	+0.12040	0.73638	204 3 28	+138.87	+62.01	-3.36

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

HELIOCENTRIC COÖRDINATES. 397

JUPITER.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
1640	-4.94458	-2.28664	+0.11994	0.73632	204 48 52	+138.08	+ 63.86	-3.35
1650	4.91326	2.35144	0.11946	0.73626	205 34 16	137.27	65.69	3.34
1660	4.88105	2.41581	0.11897	0.73620	206 19 42	136.43	67.52	3.32
1670	4.84794	2.47974	0.11844	0.73613	207 5 8	135.57	69.34	3.31
1680	4.81394	2.54321	0.11790	0.73606	207 50 35	134.68	71.15	3.30
1690	4.77906	2.60621	0.11733	0.73598	208 36 2	133.77	72.95	3.29
1700	4.74330	2.66874	0.11675	0.73590	209 21 31	132.85	74.74	3.27
1710	4.70666	2.73078	0.11614	0.73582	210 7 1	131.90	76.52	3.26
1720	4.66916	2.79232	0.11551	0.73573	210 52 32	130.93	78.30	3.24
1730	4.63081	2.85334	0.11486	0.73564	211 38 4	129.93	80.06	3.22
1740	4.59161	2.91384	0.11419	0.73555	212 23 38	128.91	81.81	3.20
1750	4.55156	2.97380	0.11349	0.73545	213 9 12	127.87	83.55	3.19
1760	4.51067	3.03322	0.11278	0.73535	213 54 48	126.81	85.28	3.17
1770	4.46895	3.09208	0.11205	0.73524	214 40 25	125.73	87.00	3.15
1780	4.42641	3.15036	0.11129	0.73513	215 26 3	124.63	88.70	3.13
1790	4.38306	3.20806	0.11051	0.73502	216 11 43	123.51	90.39	3.11
1800	4.33889	3.26517	0.10972	0.73491	216 57 24	122.36	92.08	3.09
1810	4.29391	3.32167	0.10890	0.73479	217 43 6	121.19	93.75	3.07
1820	4.24814	3.37756	0.10807	0.73466	218 28 50	120.00	95.41	3.05
1830	4.20159	3.43283	0.10721	0.73454	219 14 36	118.79	97.06	3.03
1840	4.15426	3.48746	0.10633	0.73441	220 0 23	117.56	98.69	3.01
1850	4.10616	3.54145	0.10544	0.73427	220 46 12	116.30	100.31	2.99
1860	4.05729	3.59477	0.10452	0.73414	221 32 3	115.02	101.91	2.96
1870	-4.00766	-3.64742	+0.10359	0.73400	222 17 55	+113.73	+103.51	-2.94

SATURN.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
1500	-9.49259	+0.13844	+0.37882	0.97778	179 11 3	+14.97	-0.22	-0.60
1510	9.49619	0.08255	0.37989	0.97792	179 31 17	14.96	0.13	0.60
1520	9.49945	+0.02665	0.38094	0.97805	179 51 30	14.95	-0.04	0.60
1530	9.50238	-0.02926	0.38198	0.97819	180 11 43	14.94	+0.05	0.60
1540	9.50498	0.08516	0.38301	0.97832	180 31 55	14.93	0.13	0.60
1550	9.50726	0.14106	0.38403	0.97846	180 52 6	14.92	0.22	0.60
1560	9.50921	0.19605	0.38503	0.97859	181 12 17	14.90	0.31	0.60
1570	9.51083	0.25284	0.38602	0.97873	181 32 27	14.89	0.40	0.60
1580	9.51212	0.30872	0.38700	0.97886	181 52 36	14.88	0.48	0.61
1590	9.51308	0.36459	0.38797	0.97900	182 12 44	14.87	0.57	0.61
1600	9.51372	0.42044	0.38892	0.97914	182 32 52	14.86	0.66	0.61
1610	9.51403	0.47628	0.38986	0.97928	182 52 59	14.85	0.75	0.61
1620	9.51401	0.53210	0.39078	0.97941	183 13 5	14.83	0.83	0.61
1630	9.51367	0.58791	0.39169	0.97955	183 33 10	14.82	0.92	0.61
1640	9.51300	0.64369	0.39259	0.97968	183 53 14	14.80	1.00	0.61
1650	9.51201	0.69945	0.39348	0.97982	184 13 18	14.79	1.09	0.61
1660	9.51069	0.75519	0.39435	0.97995	184 33 21	14.77	1.17	0.61
1670	9.50905	0.81090	0.39521	0.98009	184 53 23	14.75	1.26	0.61
1680	9.50708	0.86659	0.39605	0.98022	185 13 25	14.73	1.34	0.61
1690	9.50478	0.92225	0.39698	0.98036	185 33 26	14.72	1.43	0.61
1700	-9.50216	-0.97788	+0.39769	0.98049	185 53 26	+14.70	+1.51	-0.62

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

398 HELIOCENTRIC COÖRDINATES.

SATURN.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
1710	-9.49921	-1.03347	+0.39849	0.98063	186° 13' 25"	+14.69	+1.60	-0.62
1720	9.49594	1.08902	0.39928	0.98075	186 33 24	14.67	1.68	0.62
1730	9.49234	1.14454	0.40006	0.98089	186 53 21	14.65	1.77	0.62
1740	9.48842	1.20003	0.40082	0.98102	187 13 18	14.63	1.85	0.62
1750	9.48418	1.25547	0.40157	0.98116	187 33 14	14.61	1.94	0.62
1760	9.47962	1.31086	0.40230	0.98129	187 53 10	14.58	2.02	0.62
1770	9.47474	1.36621	0.40302	0.98142	188 13 05	14.56	2.10	0.62
1780	9.46954	1.42151	0.40373	0.98155	188 32 59	14.54	2.18	0.62
1790	9.46402	1.47677	0.40443	0.98169	188 52 52	14.52	2.27	0.62
1800	9.45818	1.53197	0.40511	0.98182	189 12 45	14.50	2.35	0.62
1810	9.45202	1.58712	0.40578	0.98195	189 32 37	14.48	2.43	0.62
1820	9.44554	1.64222	0.40643	0.98208	189 52 28	14.45	2.51	0.62
1830	9.43875	1.69726	0.40707	0.98222	190 12 18	14.43	2.60	0.62
1840	9.43164	1.75224	0.40770	0.98235	190 32 8	14.41	2.68	0.62
1850	9.42421	1.80717	0.40831	0.98248	190 51 57	14.39	2.76	0.62
1860	9.41647	1.86203	0.40891	0.98261	191 11 45	14.36	2.84	0.62
1870	9.40841	1.91683	0.40950	0.98274	191 31 32	14.34	2.92	0.62
1880	-9.40003	-1.97157	+0.41007	0.98287	191 51 19	+14.31	+3.00	-0.62

URANUS.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
1520	+3.65306	+18.79382	+0.02655	1.28207	79° 0' 1"	-0.10	-0.51	0.00
1560	3.49708	18.81577	0.02867	1.28190	79 28 16	0.10	0.51	0.00
1600	3.34087	18.83646	0.03079	1.28172	79 56 33	0.09	0.51	0.00
1640	3.18443	18.85584	0.03291	1.28155	80 24 51	0.09	0.51	0.00
1680	3.02780	18.87392	0.03499	1.28138	80 53 10	0.08	0.51	0.00
1720	2.87099	18.89074	0.03709	1.28121	81 21 30	0.08	0.51	0.00
1760	2.71396	18.90632	0.03917	1.28104	81 49 52	0.07	0.51	0.00
1800	2.55676	18.92060	0.04129	1.28086	82 18 15	0.07	0.51	0.00
1840	2.39940	18.93336	0.04339	1.28069	82 46 39	0.07	0.51	0.00
1880	+2.24190	+18.94477	+0.04550	1.28051	83 15 4	-0.06	-0.51	0.00

NEPTUNE.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
1520	+20.8027	+1.5993	-0.7403	1.47501	3° 5.2'	-0.28	-0.02	+0.01
1560	29.7949	1.7251	0.7427	1.47500	3 19.7	0.28	0.02	0.01
1600	29.7866	1.8509	0.7450	1.47499	3 34.2	0.28	0.02	0.01
1640	29.7778	1.9767	0.7473	1.47498	3 48.7	0.28	0.02	0.01
1680	29.7685	2.1024	0.7497	1.47497	4 3.3	0.28	0.02	0.01
1720	29.7586	2.2281	0.7520	1.47496	4 17.8	0.28	0.02	0.01
1760	29.7482	3.3538	0.7543	1.47496	4 32.3	0.28	0.02	0.01
1800	29.7374	2.4795	0.7565	1.47495	4 46.8	0.28	0.02	0.01
1840	+29.7260	+2.6051	-0.7587	1.47494	5 1.4	-0.28	-0.02	+0.01

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1868, November 18.

HELIOCENTRIC COÖRDINATES. 399

INCLINATIONS AND NODES.

Planets.	Inclination.	Increase in 100 Days.	Longitude of Ascending Node.	Increase in 100 Days.
Mercury . . .	7° 0' 8.8"	+0.01952	46° 39' 20"	11.639
Venus	3° 23' 36.3"	+0.01195	75° 25' 35"	9.001
Mars	1° 51' 2.1"	—0.00386	48° 27' 42"	7.579
Jupiter	1° 18' 39.5"	—0.05689	99° 1' 38"	9.993
Saturn	2° 29' 21.2"	—0.03824	112° 24' 8"	8.570
Uranus	0° 46' 29.8"	+0.00634	73° 16' 44"	4.898
Neptune	1° 46' 29.0"		130° 12' 8"	

LOGARITHMS OF MASSES.

Sun's = 1.

Mercury, 93.3129	The Earth, 94.44985	Jupiter, 96.979689	Uranus, 95.60371
Venus, 94.4089	Mars, 93.57176	Saturn, 96.45573	Neptune, 95.72630

ECLIPSES IN 1863.

In the year 1863 there will be four Eclipses ; two of the Sun, and two of the Moon.

I. A Partial Eclipse of the Sun, May 16-17, 1863, invisible at Washington, with the following elements :—

Washington mean time of δ in Right Ascension, May 17 $0^h 9^m 27.4^s$.

Sun's and Moon's R. A.	$3^h 35^m 46.29^s$	Hourly Motions	9.92 and 130.29
Sun's Declination	$+19^\circ 19' 46.7''$	Hourly Motion	$+ 0' 33.8''$
Moon's Declination	$+20 18 45.6$	" "	$+ 4 29.4$
Sun's Equa. Hor. Par.	8.5	True Semidiameter	15 48.5
Moon's Equa. Hor. Par.	55 6.9	" "	15 0.4

From these elements may be deduced the following results :—

Eclipse begins on the Earth, May 16^d 21^h 40^m.1, Washington mean time, in longitude 68° 59'.7 West from Washington, and in latitude 32° 54'.3 North.

Greatest Eclipse, 16^d 23^h 52^m.2, in longitude 156° 6'.5 West from Washington, and in latitude 69° 17'.0 North.

Eclipse ends on the Earth 17^d 2^h 4^m.4, in longitude 279° 51'.3, West from Washington, and in latitude 47° 15'.7 North.

Magnitude of Greatest Eclipse = 0.861 (Sun's diameter = 1).

DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
$h\ m$				9.97	9.97	+9.51	+9.52	
21 40	-1.27871	+1.45346	+0.33298	5572	4166	3510	4972	325° 57' 44.7
21 50	1.19316	1.46557	0.34505	5568	4162	3544	5005	328 27 45.3
22 0	1.10761	1.47767	0.35711	5564	4158	3578	5037	330 57 45.9
22 10	1.02206	1.48976	0.36916	5560	4153	3612	5070	333 27 46.5
22 20	0.93651	1.50184	0.38120	5556	4149	3646	5103	335 57 47.2
22 30	0.85095	1.51391	0.39323	5552	4145	3680	5136	338 27 47.8
22 40	0.76540	1.52597	0.40525	5548	4141	3713	5169	340 57 48.4
22 50	0.67984	1.53802	0.41727	5544	4137	3747	5202	343 27 49.0
23 0	0.59428	1.55006	0.42928	5540	4133	3781	5234	345 57 49.6
23 10	0.50872	1.56209	0.44128	5536	4128	3815	5267	348 27 50.2
23 20	0.42316	1.57411	0.45327	5532	4124	3849	5300	350 57 50.8
23 30	0.33760	1.58613	0.46525	5528	4120	3882	5333	353 27 51.4
23 40	-0.25204	+1.59814	+0.47722	5524	4116	3916	5366	355 57 52.0

ECLIPSE

— OF —

MAY 16-17, 1863.



KILBURN & MALLORY. SC.

DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
^h ^m				9.97	9.97	+9.51	+9.52	
23 50	-0.16648	+1.61013	+0.48918	5520	4112	3950	5398	358° 27' 52".6
0 0	-0.08091	1.62211	0.50113	5516	4108	3984	5431	0 57 53.2
0 10	+0.00465	1.63408	0.51307	5512	4104	4017	5464	3 27 53.8
0 20	0.09022	1.64604	0.52501	5508	4099	4051	5497	5 57 54.5
0 30	0.17579	1.65800	0.53694	5504	4095	4085	5529	8 27 55.1
0 40	0.26136	1.66994	0.54886	5500	4091	4119	5562	10 57 55.7
0 50	0.34692	1.68188	0.56077	5495	4087	4152	5595	13 27 56.3
1 0	0.43248	1.69381	0.57267	5491	4083	4186	5628	15 57 56.9
1 10	0.51805	1.70573	0.58456	5487	4079	4220	5660	18 27 57.5
1 20	0.60361	1.71763	0.59644	5483	4074	4253	5693	20 57 58.1
1 30	0.68917	1.72952	0.60832	5479	4070	4287	5726	23 27 58.7
1 40	0.77473	1.74140	0.62019	5475	4066	4321	5758	25 57 59.3
1 50	0.86029	1.75327	0.63204	5471	4062	4355	5791	28 27 59.9
2 0	0.94585	1.76514	0.64388	5467	4058	4388	5824	30 58 0.5
2 10	+1.03141	+1.77700	+0.65571	5463	4054	4422	5857	33 28 1.1

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A'.	B'.	C'.
^h ^m						
21 30	+8554.3	+1212.2	+1207.8	+142.57	+20.20	+20.13
22 0	8555.0	1209.4	1205.3	142.58	20.16	20.09
22 30	8555.5	1206.5	1202.7	142.59	20.11	20.04
23 0	8555.9	1203.7	1200.1	142.60	20.06	20.00
23 30	8556.2	1200.8	1197.5	142.60	20.01	19.96
0 0	8556.4	1197.9	1194.9	142.61	19.96	19.91
0 30	8556.5	1195.0	1192.2	142.61	19.92	19.87
1 0	8556.4	1192.0	1189.6	142.61	19.87	19.83
1 30	8556.2	1188.9	1186.9	142.60	19.81	19.78
2 0	8555.9	1185.9	1184.2	142.60	19.76	19.74
2 30	+8555.5	+1182.8	+1181.5	+142.59	+19.71	+19.69

II. A Total Eclipse of the Moon, June 1, 1863, partially visible at Washington, with the following elements:—

Washington mean time of δ in Right Ascension, June 1 ^d 6 ^h 16 ^m 19.7.

Sun's Right Ascension	^h ^m ^s 4 37 17.94	Hourly Motion	^s 10.23
Moon's Right Ascension	16 37 17.94	" "	160.57

Sun's Declination	+22° 5' 41.0	Hourly Motion	+ 0' 20.2
Moon's Declination	-21 43 46.8	" "	- 1 49.5
Sun's Equa. Hor. Par.	8.5	True Semidiameter	15 46.1
Moon's Equa. Hor. Par.	60 41.1	" "	16 31.4

From these elements may be deduced the following results:—

Moon enters Penumbra, June	^d 1 ^h 3 ^m 42.4	Washington mean time.
Moon enters Shadow	1 4 37.7	" "
Total Phase begins	1 5 44.5	" "
Middle of Total Phase	1 6 17.9	" "
Total Phase ends	1 6 51.3	" "
Moon leaves Shadow	1 7 58.1	" "
Moon leaves Penumbra	1 8 53.2	" "

First contact of Shadow with Moon's limb 113° from north point towards the East, when the Moon is vertical in longitude $251^{\circ} 4'$ West from Washington, and in latitude $21^{\circ} 48'$ South.

Last contact of Shadow with Moon's limb 109° from north point towards the West, when the Moon is vertical in longitude $299^{\circ} 4'$ West from Washington, and in latitude $21^{\circ} 55'$ South.

Magnitude of Eclipse = 1.224 (Moon's diameter = 1).

III. An Annular Eclipse of the Sun, November 10, 1863, invisible at Washington, with the following elements:—

Washington mean time of ϕ in Right Ascension, November 10 ^d 15 ^h 17 ^m 43.8.

Sun's and Moon's R. A.	^h 15 ^m 4 5.51	Hourly Motions	10.14 and 143.97
Sun's Declination	$-17^{\circ} 20' 24.0$	Hourly Motion	$-0^{\circ} 41.7$
Moon's Declination	$-18^{\circ} 12' 25.0$	" "	$-6^{\circ} 32.5$
Sun's Equa. Hor. Par.	8.7	True Semidiameter	16 9.9
Moon's Equa. Hor. Par.	58 32.8	" "	15 56.4

From these elements may be deduced the following results:—

Eclipse begins on the Earth, November 10^d 12^h 41^m.6, Washington mean time, in longitude $291^{\circ} 55'.1$ West from Washington, and in latitude $22^{\circ} 59'.2$ South.

Central Eclipse begins on the Earth 14^h 8^m.4, in longitude $326^{\circ} 13'.6$ West from Washington, and in latitude $48^{\circ} 2'.6$ South.

Central Eclipse at Noon 15^h 17^m.7, in longitude $233^{\circ} 23'.9$ West from Washington, and in latitude $80^{\circ} 43'.5$ South.

Central Eclipse ends on the Earth 15^h 52^m.0, in longitude $109^{\circ} 42'.3$ West from Washington, and in latitude $65^{\circ} 14'.2$ South.

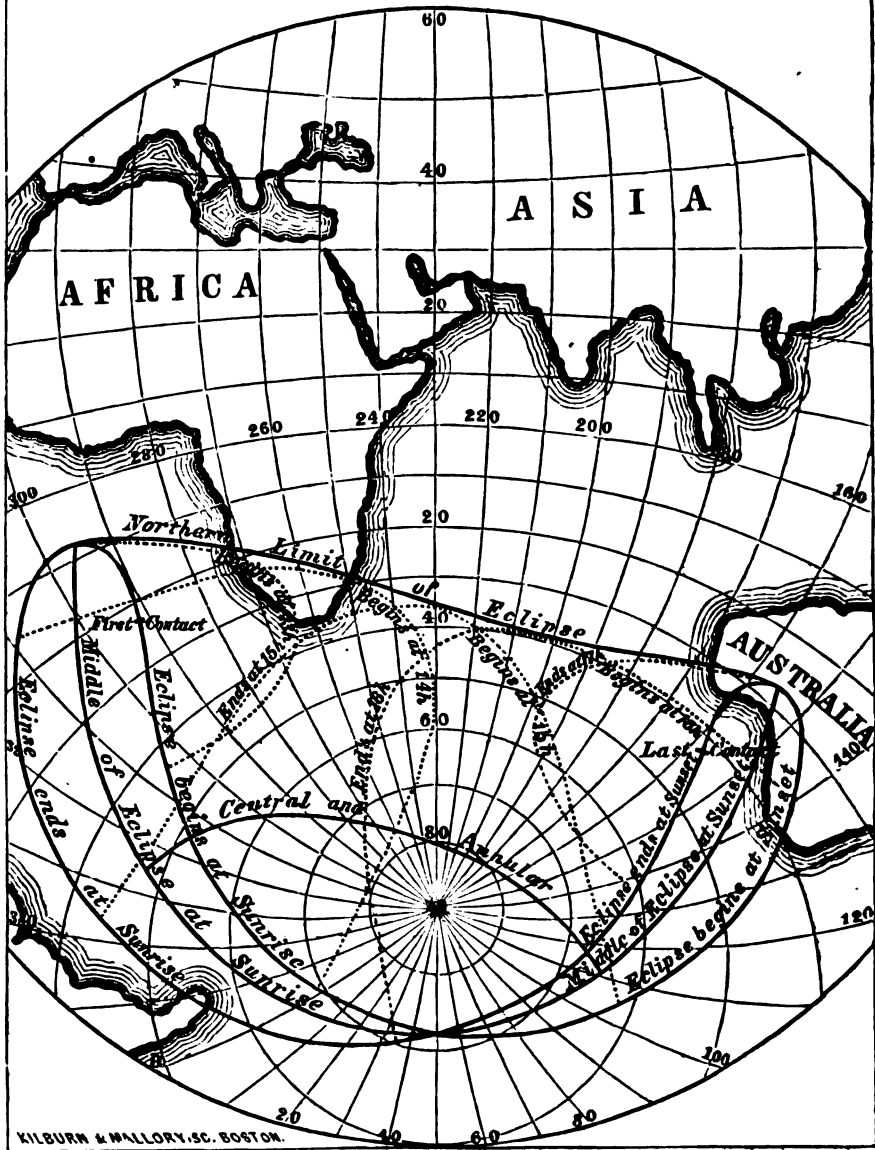
Eclipse ends on the Earth 17^h 18^m.7, in longitude $157^{\circ} 8'.2$, West from Washington, and in latitude $42^{\circ} 28'.6$ South.

DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
^h ^m				9.97	9.98	-9.48	-9.46	
12 40	-1.43131	-0.07749	-1.17740	9236	0515	0035	6862	$193^{\circ} 57' 54.8$
12 50	1.34066	0.09425	1.19414	9231	0510	0080	6909	$196^{\circ} 27' 55.0$
13 0	1.24901	0.11101	1.21087	9226	0506	0126	6956	$198^{\circ} 57' 55.1$
13 10	1.15835	0.12776	1.22759	9222	0502	0171	7003	$201^{\circ} 27' 55.2$
13 20	1.06769	0.14450	1.24430	9217	0497	0216	7050	$203^{\circ} 57' 55.3$
13 30	0.97702	0.16123	1.26101	9213	0493	0262	7097	$206^{\circ} 27' 55.5$
13 40	0.88635	0.17795	1.27771	9208	0488	0307	7143	$208^{\circ} 57' 55.6$
13 50	0.79567	0.19466	1.29440	9204	0484	0352	7190	$211^{\circ} 27' 55.7$
14 0	0.70499	0.21137	1.31107	9199	0480	0397	7237	$213^{\circ} 57' 55.8$
14 10	-0.61430	-0.22807	-1.32773	9195	0475	0443	7284	$216^{\circ} 27' 56.0$

ANNULAR ECLIPSE

— OF —
NOV. 10, 1863.



DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
h m				9.97	9.98	-9.48	-9.46	
14 20	-0.52361	-0.24176	-1.34439	9190	0471	0488	7331	218° 57' 56.1
14 30	0.43292	0.26144	1.36104	9186	0466	0533	7377	221 27 56.2
14 40	0.34222	0.27811	1.37768	9181	0462	0578	7424	223 57 56.3
14 50	0.25152	0.29478	1.39431	9176	0458	0623	7471	226 27 56.4
15 0	0.16082	0.31144	1.41094	9172	0453	0669	7518	228 57 56.6
15 10	-0.07012	0.32809	1.42756	9167	0449	0714	7564	231 27 56.7
15 20	+0.02059	0.34473	1.44416	9163	0444	0759	7611	233 57 56.8
15 30	0.11130	0.36136	1.46075	9158	0440	0804	7658	236 27 56.9
15 40	0.20201	0.37799	1.47734	9154	0435	0849	7704	238 57 57.0
15 50	0.29272	0.39461	1.49391	9149	0431	0895	7751	241 27 57.2
16 0	0.38343	0.41123	1.51047	9145	0427	0940	7798	243 57 57.3
16 10	0.47414	0.42783	1.52702	9140	0422	0985	7845	246 27 57.4
16 20	0.56486	0.44443	1.54357	9135	0418	1030	7891	248 57 57.5
16 30	0.65557	0.46102	1.56011	9131	0414	1075	7938	251 27 57.6
16 40	0.74629	0.47760	1.57664	9126	0409	1120	7984	253 57 57.7
16 50	0.83701	0.49417	1.59316	9122	0405	1166	8031	256 27 57.9
17 0	0.92773	0.51073	1.60967	9117	0400	1211	8078	258 57 58.0
17 10	1.01844	0.52728	1.62617	9113	0396	1256	8124	261 27 58.1
17 20	+1.10916	-0.54383	-1.64267	9108	0391	1301	8171	263 57 58.2

FOR SHADOW.

Washington Mean Time.	B.	C.	Washington Mean Time.	B.	C.
h m			h m		
14 0	-0.75725	-0.76519	15 0	-0.85733	-0.86505
14 10	0.77395	0.78185	15 10	0.87398	0.88167
14 20	0.79064	0.79851	15 20	0.89062	0.89827
14 30	0.80732	0.81516	15 30	0.90725	0.91486
14 40	0.82400	0.83180	15 40	0.92388	0.93145
14 50	0.84067	0.84843	15 50	0.94050	0.94802
15 0	-0.85733	-0.86505	16 0	-0.95712	-0.96458

A and μ are given in the Table for Penumbra, and the values of log E, log F, log G, and log H may be obtained from corresponding values for Penumbra, by numerically increasing log E and decreasing log F by 0.000003, and by numerically decreasing log G and increasing log H by 0.000032.

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A'.	B'.	C'.
h m						
12 30	+9064.0	-1677.5	-1675.5	+151.07	-27.96	-27.92
13 0	9065.6	1675.1	1672.8	151.09	27.92	27.88
13 30	9067.0	1672.7	1670.0	151.12	27.88	27.83
14 0	9068.3	1670.3	1667.2	151.14	27.84	27.79
14 30	9069.4	1667.9	1664.4	151.16	27.80	27.74
15 0	9070.2	1665.5	1661.6	151.17	27.76	27.69
15 30	9070.8	1663.1	1658.8	151.18	27.72	27.65
16 0	9071.3	1660.7	1656.0	151.19	27.68	27.60
16 30	9071.7	1658.3	1653.3	151.19	27.64	27.55
17 0	9071.8	1656.0	1650.5	151.20	27.60	27.51
17 30	+9071.8	-1653.8	-1647.8	+151.20	-27.56	-27.46

IV. A Partial Eclipse of the Moon, November 24, 1863, visible at Washington, with the following elements:—

Washington mean time of δ in Right Ascension, November 24^d 15^h 42^m 29.0^s.

Sun's Right Ascension	16 ^h 2 ^m 16.76 ^s	Hourly Motion	10.61 ^s
Moon's Right Ascension	4 2 16.76	" "	134.65
Sun's Declination	—20° 42' 4.5"	Hourly Motion	— 0' 29.7"
Moon's Declination	+20 15 20.2	" "	+ 3 19.6
Sun's Equa. Hor. Par.	8.7	True Semidiameter	16 12.8
Moon's Equa. Hor. Par.	55 53.2	" "	15 13.0

From these elements may be deduced the following results:—

Moon enters Penumbra, November	24 ^d 12 ^h 57.0 ^m	Washington mean time.
Moon enters Shadow	24 14 7.4	" "
Middle of Eclipse	24 15 47.8	" "
Moon leaves Shadow	24 17 28.3	" "
Moon leaves Penumbra	24 18 39.0	" "

First contact of Shadow with Moon's limb 56° from north point towards the East, when the Moon is vertical in longitude 35° 55' West from Washington, and in latitude 20° 17' North.

Last contact of Shadow with Moon's limb 67° from north point towards the West, when the Moon is vertical in longitude 84° 24' West from Washington, and in latitude 20° 29' North.

Magnitude of Eclipse = 0.956 (Moon's diameter = 1).

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	P'	Q'	Log sin D	Log cos D
Jan. 1	56 Tauri	6½	+90	+23	2 26.7	— 7 1 4	+0.7773	0.5459	+0.0497	+9.5629	9.9689
1	α ¹ Tauri	5½	+58	— 3	5 7.3	— 4 25 44	+0.3109	.5463	+0.0456	+9.5731	.9672
1	α ² Tauri	6½	+66	+ 3	5 8.9	— 4 24 8	+0.4153	.5463	+0.0454	+9.5714	.9675
1	ν ¹ Tauri	5	+25	—33	5 33.0	— 4 0 51	—0.2493	.5465	+0.0441	+9.5828	.9656
1	ν ² Tauri	6	+14	—45	6 0.9	— 3 33 49	—0.4335	.5465	+0.0440	+9.5862	.9650
1	τ Tauri	4½	+28	—28	13 0.8	+ 3 12 17	—0.1820	.5471	+0.0304	+9.5863	.9650
1	99 Tauri	6½	—40	—67	20 15.5	+10 12 43	—1.1703	.5476	+0.0158	+9.6047	.9616
2	URANUS		+24	—30	4 21.3	— 5 57 31	—0.2659	.5499	+0.0002	+9.5915	.9641
2	π Tauri	6	+90	+33	6 20.1	— 4 2 38	+0.8682	.5480	—0.0039	+9.5726	.9673
2	σ Tauri	6	+90	+40	10 14.7	— 0 15 44	+0.9891	.5479	—0.0118	+9.5701	.9677
2	B.A.C. 1764	6½	— 1	—63	15 38.2	+ 4 57 11	—0.6853	.5475	—0.0216	+9.5961	.9633
3	141 Tauri	6	+34	—24	2 11.5	— 8 50 18	—0.0868	.5468	—0.0430	+9.5809	.9659
3	1 Geminor.	5	—32	—67	3 18.4	— 7 45 33	—1.1059	.5454	—0.0450	+9.5966	.9632
3	B.A.C. 1970	6½	+36	—23	5 53.3	— 5 15 47	—0.0524	.5465	—0.0498	+9.5775	.9665
3	3 Geminor.	6	—30	—67	5 57.2	— 5 11 59	—1.0817	.5465	—0.0499	+9.5943	.9636
3	6 Geminor.	6	—17	—67	7 10.6	— 4 1 0	—0.9247	.5463	—0.0524	+9.5907	.9642
3	η Geminor.	4	+ 7	—54	8 24.1	— 2 49 51	—0.5540	.5461	—0.0545	+9.5836	.9655
3	μ Geminor.	3	— 9	—68	12 12.6	+ 0 51 12	—0.8166	.5454	—0.0616	+9.5844	.9654
3	15 Geminor.	6	+90	+31	14 32.9	+ 3 6 55	+0.9345	.5450	—0.0661	+9.5518	.9705
3	16 Geminor.	6	+90	+62	14 38.1	+ 3 12 0	+1.2578	.5449	—0.0663	+9.5458	.9714
4	d Geminor.	6	—30	—68	1 50.1	— 9 57 45	—1.0932	.5426	—0.0867	+9.5721	.9674
4	ζ Geminor.	4	+18	—46	7 53.5	— 4 5 58	—0.3715	.5414	—0.0972	+9.5487	.9708
4	56 Geminor.	5½	—40	—70	16 31.2	+ 4 15 13	—1.1965	.5389	—0.1118	+9.5484	.9710
4	B.A.C. 2432	6½	+90	+42	17 7.7	+ 4 50 35	+1.1376	.5387	—0.1129	+9.5022	.9769
5	f Geminor.	6	+90	+16	1 8.1	—11 24 5	+0.7921	.5363	—0.1256	+9.4896	.9762
5	g Geminor.	5½	+ 7	—63	4 22.9	— 8 15 25	—0.5732	.5353	—0.1303	+9.5092	.9761
5	3 Cancri	6	+24	—45	11 38.7	— 1 13 9	—0.2736	.5331	—0.1410	+9.4825	.9790
5	5 Cancri	6	+82	+ 3	12 1.2	— 0 51 20	+0.6131	.5331	—0.1415	+9.4618	.9810
5	B.A.C. 2731	6½	+ 3	—69	16 14.2	+ 3 13 49	—0.6423	.5319	—0.1475	+9.4760	.9796
6	29 Cancri	6	+90	+22	1 37.3	—11 40 19	+0.9552	.5289	—0.1598	+9.4032	.9866
6	α Cancri	4	+90	+16	16 48.7	+ 3 3 31	+0.8960	.5249	—0.1772	+9.3313	.9898
6	π Cancri	5	+90	+56	21 34.7	+ 7 41 3	+1.3216	.5240	—0.1824	+9.2890	.9916
6	B.A.C. 3122	6½	+47	—27	22 35.8	+ 8 40 19	+0.1436	.5235	—0.1830	+9.3220	.9902
7	ω Leonis	6	+90	+24	8 16.1	— 5 56 36	+1.0359	.5213	—0.1919	+9.2241	.9938
7	λ Leonis	6	+36	—38	10 4.5	— 4 11 27	—0.0412	.5208	—0.1935	+9.2530	.9929
7	ο Leonis	3½	—33	—80	14 50.9	+ 0 26 29	—1.1871	.5200	—0.1971	+9.2611	.9926
7	B.A.C. 3407	6	—42	—81	23 41.3	+ 9 1 19	—1.2647	.5189	—0.2032	+9.1525	.9947
8	π Leonis	5	—34	—81	0 46.9	+10 5 4	—1.1976	.5188	—0.2038	+9.1795	.9950
8	14 Sextantis	6	+90	+ 2	4 14.7	—10 33 13	+0.7295	.5186	—0.2062	+9.0386	.9974
8	16 Sextantis	6	+31	—46	5 31.1	— 9 19 6	—0.1459	.5186	—0.2069	+9.0758	.9969
8	34 Sextantis	6	—22	—86	22 57.9	+ 7 37 6	—1.0627	.5183	—0.2147	+8.8743	.9988
9	36 Sextantis	6	+30	—48	0 17.4	+ 8 54 13	—0.1694	.5184	—0.2147	+8.8744	.9993
9	B.A.C. 3726	6	+79	— 6	3 58.6	—11 30 59	+0.6068	.5186	—0.2157	+8.4249	.9998
9	55 Leonis	6	+72	—11	5 46.8	— 9 46 1	+0.5260	.5188	—0.2164	+8.4674	9.9989
9	p ² Leonis	6	+64	—16	9 53.8	— 5 46 17	+0.4212	.5187	—0.2169	+8.1071	0.0000
9	p ⁴ Leonis	5	+ 4	—84	15 8.7	— 0 40 39	—0.6531	.5200	—0.2175	+8.0694	0.0000
9	e Leonis	5	+81	— 5	23 39.6	+ 7 35 3	+0.6266	.5222	—0.2177	—8.5042	9.9997
10	B.A.C. 4006	6	+86	+ 6	10 12.2	— 6 11 16	+0.8128	.5250	—0.2163	—8.9018	.9986
11	q Virginis	6	+79	— 3	7 24.3	— 9 38 20	+0.6575	.5349	—0.2080	—9.1776	.9950
11	B.A.C. 4312	6½	+28	—47	15 52.7	— 1 26 8	—0.1422	.5394	—0.2027	—9.2219	.9939
11	ψ Virginis	5	—45	—90	17 18.2	— 0 3 23	—1.2668	.5403	—0.2017	—9.1845	.9949
11	g Virginis	6	—46	—90	23 41.5	+ 6 7 27	—1.2659	.5445	—0.1963	—9.2401	.9934
12	i Virginis	5	—14	—90	8 24.9	— 9 26 26	—0.8720	.5504	—0.1878	—9.3178	.9904
12	B.A.C. 4531	6	—24	—90	12 2.2	— 5 56 30	—1.0074	.5531	—0.1841	—9.3356	.9876
12	83 Virginis	6	+75	+47	16 25.9	— 1 41 47	+1.2761	0.5565	—0.1796	—9.4266	9.9839

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		<i>H</i>	<i>I</i>	<i>p'</i>	<i>q'</i>	Log sin <i>D</i>	Log cos <i>D</i>
Jan. 12	85 Virginis	6	+68	+4	16 55.5	^h ^m ^s — 1 13 8	+0.7636	0.5564	— .1783	— 9.4152	9.9848
13	B.A.C. 4700	5½	+2	— 76	4 3.2	+ 9 31 14	— 0.5495	.5653	— .1637	— 9.4311	.9686
13	B.A.C. 4722	6	+73	+27	6 0.6	+11 24 23	+1.0884	.5668	— .1605	— 9.4796	.9773
14	♌ Libræ	4½	— 1	— 72	5 42.5	+10 13 41	— 0.4961	.5864	— .1178	— 9.5186	.9750
14	♌ Libræ	6½	— 12	— 90	6 9.4	+10 39 32	— 0.6952	.5867	— .1174	— 9.5154	.9754
14	B.A.C. 5231	6	— 32	— 90	23 46.9	+ 3 35 28	— 0.9448	.5997	— .0771	— 9.5460	.9714
15	♏ Scorpii	2½	+62	— 2	0 39.1	+ 4 25 37	+0.6382	.6003	— .0750	— 9.5778	.9664
15	B.A.C. 5395	6	— 30	— 90	5 48.9	+ 9 22 50	— 0.8972	.6034	— .0623	— 9.5553	.9700
15	♏ Ophiuchi	5	+67	+16	10 18.2	— 10 18 53	+0.9220	.6050	— .0515	— 9.5842	.9676
15	♏ Ophiuchi	5	— 51	— 90	12 49.6	— 7 53 45	— 1.1463	.6073	— .0442	— 9.5576	.9697
15	22 Ophiuchi	6½	+62	0	21 19.1	+ 0 14 38	+0.6740	.6111	— .0220	— 9.5869	.9631
15	24 Ophiuchi	6½	+34	— 21	22 3.4	+ 0 57 6	+0.3077	.6114	— .0198	— 9.5906	.9642
16	B.A.C. 5831	6	+66	+46	5 57.6	+ 8 31 25	+1.2156	.6139	+ .0020	— 9.6779	.9610
16	c♏ Ophiuchi	5	+66	+43	10 53.7	— 10 44 50	+1.1940	.6148	+ .0159	— 9.6168	.9612
16	B.A.C. 5954	6	— 24	— 90	13 39.3	— 8 6 23	— 0.7499	.6153	+ .0237	— 9.5763	.9667
16	58 Ophiuchi	5	— 34	— 90	15 23.8	— 6 26 22	— 0.9160	.6155	+ .0288	— 9.5662	.9683
16	B.A.C. 6388	6	+48	— 11	22 11.6	+ 0 4 10	+0.4871	.6156	+ .0471	— 9.5878	.9648
17	♐ Sagittarii	4	— 32	— 90	2 37.3	+ 4 18 39	— 0.9311	.6153	+ .0537	— 9.5561	.9689
17	14 Sagittarii	6	+5	— 56	2 47.7	+ 4 28 35	— 0.2770	.6152	+ .0602	— 9.5688	.9679
17	15 Sagittarii	5	— 57	— 90	3 10.1	+ 4 50 6	— 1.2184	.6143	+ .0624	— 9.5417	.9708
17	21 Sagittarii	5	— 37	— 90	6 55.8	+ 8 26 18	— 1.1200	.6143	+ .0711	— 9.5466	.9713
20	c♐ Capricor.	6	+75	— 6	14 23.9	— 11 13 4	+0.6035	.5688	+ .2167	— 9.2270	.9937
20	c♐ Capricor.	6½	+80	+13	14 56.7	— 10 41 30	+0.9185	.5686	+ .2169	— 9.2256	.9935
20	30 Aquarii	5½	+28	— 48	22 25.8	— 3 28 15	— 0.1631	.5634	+ .2220	— 9.0171	.9866
21	44 Aquarii	6	+43	— 33	4 35.8	+ 2 28 55	+0.0974	.5598	+ .2251	— 9.0242	.9976
21	51 Aquarii	6	+53	— 25	7 44.7	+ 5 31 18	+0.2634	.5578	+ .2261	— 8.9838	.9980
21	♑ Aquarii	5	+85	+23	13 56.4	+11 30 18	+1.0705	.5546	+ .2278	— 8.9345	.9984
22	3 Piscium	6	— 16	— 90	0 29.1	— 2 18 14	— 0.9734	.5493	+ .2286	— 7.9807	0.0000
22	♓ Piscium	4½	+90	+2	12 47.8	+ 9 36 11	+0.7509	.5440	+ .2265	+ 7.9471	.0000
22	9 Piscium	6	+90	+13	12 56.8	+ 9 44 52	+0.9251	.5440	+ .2265	+ 7.8111	0.0000
22	16 Piscium	6	+90	+11	17 17.3	— 10 3 4	+0.9063	.5428	+ .2252	+ 8.3704	.9999
22	19 Piscium	6	+74	— 9	22 2.8	— 5 26 48	+0.5457	.5411	+ .2232	+ 8.6777	.9966
23	d Piscium	5½	— 2	— 79	14 27.7	+10 26 41	— 0.7565	.5370	+ .2133	+ 9.1116	.9963
23	45 Piscium	6	+55	— 22	16 55.3	— 11 10 26	+0.2847	.5268	+ .2116	+ 9.0818	.9968
24	75 Piscium	6½	— 46	— 78	12 42.6	+ 7 59 26	— 1.2820	.5348	+ .1933	+ 9.3257	.9901
25	101 Piscium	6	+11	— 64	2 52.8	— 2 17 9	— 0.5123	.5348	+ .1773	+ 9.3825	.9970
25	104 Piscium	6	+49	— 23	4 34.0	— 0 39 9	+0.1811	.5348	+ .1750	+ 9.3710	.9977
26	27 Arietis	6½	+59	— 12	5 27.7	— 0 32 44	+0.3485	.5373	+ .1405	+ 9.4683	.9804
26	B.A.C. 732	6½	— 4	— 72	6 44.2	+ 0 41 16	— 0.7525	.5375	+ .1397	+ 9.4163	.9775
26	40 Arietis	6	+90	+17	13 54.1	+ 7 37 28	+0.8116	.5384	+ .1275	+ 9.4832	.9769
26	♈ Arietis	6	+90	+36	17 22.7	+10 59 26	+1.1795	.5390	+ .1214	+ 9.4847	.9788
26	47 Arietis	6	— 48	— 70	18 24.2	+11 58 54	— 1.2520	.5391	+ .1199	+ 9.5365	.9727
27	♈ Arietis	4½	+71	0	0 52.7	— 5 45 3	+0.4843	.5401	+ .1094	+ 9.5172	.9751
27	♈ Arietis	4½	— 8	— 70	2 25.2	+ 4 15 34	— 0.8039	.5404	+ .1065	+ 9.5450	.9715
27	B.A.C. 1032	6½	+43	— 21	5 28.2	— 1 18 1	+0.0657	.5408	+ .1020	+ 9.5343	.9729
27	♈ Arietis	5	+4	— 63	5 25.0	— 1 21 33	— 0.6200	.5410	+ .1013	+ 9.5474	.9712
27	♈ Arietis	6	+33	— 31	6 9.4	— 0 38 37	— 0.1057	.5411	+ .1003	+ 9.5382	.9723
27	65 Arietis	6	+33	— 30	6 56.8	+ 0 7 17	— 0.0978	.5412	+ .0991	+ 9.5405	.9721
27	32 Tauri	6	— 4	— 68	22 13.4	— 9 5 52	— 0.7303	.5434	+ .0714	+ 9.5751	.9669
28	A♉ Tauri	4½	+34	— 25	1 54.8	— 5 30 41	— 0.0730	.5437	+ .0647	+ 9.5680	.9681
28	A♉ Tauri	6	+40	— 20	2 12.6	— 5 14 24	+0.0205	.5438	+ .0641	+ 9.5667	.9683
28	56 Tauri	6½	+86	+14	8 56.0	+ 1 15 47	+0.6260	.5446	+ .0515	+ 9.5629	.9689
28	♉ Tauri	5	+49	— 11	11 36.7	+ 3 51 14	+0.1640	.5449	+ .0462	+ 9.5731	.9672
28	♉ Tauri	6½	+55	— 5	11 38.3	+ 3 52 48	+0.2641	.5449	+ .0461	+ 9.5714	.9673
28	♉ Tauri	5	+16	— 42	12 2.3	+ 4 16 0	— 0.3422	0.5449	+ .0454	+ 9.5824	.9656

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	I	p'	q'	Log sin D	Log cos D
Jan. 28	ν° Tauri	6	+ 6	-55	12 30.2	+ 4 43 1	-0.5771	0.5449	+.0427	+9.5862	9.9656
	τ Tauri	4 $\frac{1}{2}$	+29	-36	19 30.5	+11 29 30	-0.3200	.5455	+.0312	+9.5863	.9650
	105 Tauri	6	+90	+60	7 33.7	- 0 51 4	+1.2114	.5460	+.0075	+9.5645	.9686
	URANUS	6	+21	-33	9 13.0	+ 0 45 1	-0.3087	.5470	+.0049	+9.5901	.9643
	κ Tauri	6	+90	+26	12 51.8	+ 4 16 38	+0.7471	.5461	-.0027	+9.5726	.9673
	σ Tauri	6	+90	+33	16 47.1	+ 8 4 11	+0.8720	.5461	-.0105	+9.5701	.9677
	B.A.C. 1774	6 $\frac{1}{2}$	- 8	-67	22 11.3	-10 42 10	-0.7918	.5459	-.0208	+9.5961	.9633
	141 Tauri	6	+28	-29	8 46.1	- 0 28 11	-0.1798	.5453	-.0414	+9.5809	.9659
	1 Geminor.	5	-43	-67	9 53.1	+ 0 36 41	-1.1959	.5451	-.0433	+9.5966	.9632
	B.A.C. 1970	6 $\frac{1}{2}$	+31	-27	12 28.3	+ 3 6 47	-0.1402	.5449	-.0484	+9.5775	.9665
	3 Geminor.	6	-39	-67	12 32.2	+ 3 10 35	-1.1673	.5448	-.0485	+9.5943	.9636
	6 Geminor.	6	-23	-67	13 45.8	+ 4 21 44	-1.0093	.5447	-.0509	+9.5907	.9642
	η Geminor.	4	+ 2	-61	14 59.4	+ 5 32 57	-0.6377	.5446	-.0530	+9.5836	.9655
	μ Geminor.	3	-14	-63	18 48.3	+ 9 14 24	-0.8943	.5443	-.0602	+9.5844	.9654
	15 Geminor.	6	+90	+26	21 8.7	+11 30 15	+0.8576	.5439	-.0643	+9.5618	.9705
	16 Geminor.	6	+90	+52	21 13.9	+11 35 20	+1.1806	.5439	-.0644	+9.5458	.9714
	d Geminor.	6	-51	-68	8 26.2	- 1 34 5	-1.1535	.5415	-.0852	+9.5721	.9674
	t Geminor.	4	+15	-49	14 29.5	+ 4 17 30	-0.4198	.5409	-.0958	+9.5497	.9708
	56 Geminor.	5 $\frac{1}{2}$	-44	-69	23 6.2	-11 22 11	-1.2252	.5391	-.1100	+9.5484	.9710
	B.A.C. 2432	6 $\frac{1}{2}$	+90	+39	23 42.7	-10 46 54	+1.1020	.5391	-.1112	+9.5022	.9769
Feb. 1	f Geminor.	6	+90	+16	7 41.6	- 3 3 5	+0.7707	.5372	-.1240	+9.4895	.9782
	g Geminor.	5 $\frac{1}{2}$	+ 6	-64	10 55.6	+ 0 4 50	-0.5857	.5365	-.1287	+9.5091	.9761
	3 Cancri	6	+23	-45	18 9.4	+ 7 5 2	-0.2749	.5347	-.1395	+9.4824	.9790
	5 Cancri	6	+82	+ 3	18 31.7	+ 7 26 41	+0.6101	.5347	-.1403	+9.4617	.9810
	B.A.C. 2731	6 $\frac{1}{2}$	+ 3	-69	22 43.9	+11 30 21	-0.6342	.5337	-.1462	+9.4760	.9796
	29 Cancri	6	+90	+24	8 2.5	- 3 27 39	+0.9767	.5315	-.1587	+9.4032	.9856
	α Cancri	4	+90	+20	23 5.8	+11 8 11	+0.9455	.5286	-.1764	+9.3313	.9898
	B.A.C. 3122	6 $\frac{1}{2}$	+51	-22	4 49.8	- 7 18 13	+0.2192	.5270	-.1825	+9.3220	.9902
	ω Leonis	6	+90	+30	14 23.5	+ 1 58 13	+1.1151	.5253	-.1916	+9.2241	.9938
	λ Leonis	6	+41	-33	16 10.6	+ 3 42 4	+0.0447	.5252	-.1930	+9.2530	.9929
	σ Leonis	3 $\frac{1}{2}$	-25	-80	20 53.6	+ 8 16 43	-1.0882	.5247	-.1968	+9.2610	.9926
	B.A.C. 3407	6	-30	-81	5 37.6	- 7 14 54	-1.1492	.5235	-.2032	+9.1925	.9947
	π Leonis	5	-24	-82	6 42.5	- 6 11 54	-1.0804	.5235	-.2039	+9.1795	.9950
	14 Sextantis	6	+90	+ 9	10 7.8	- 2 52 43	+0.8466	.5232	-.2060	+9.0386	.9974
	16 Sextantis	6	+37	-39	11 23.9	- 1 38 50	-0.0242	.5230	-.2069	+9.0757	.9969
	34 Sextantis	6	-12	-86	4 37.8	- 8 55 38	-0.9072	.5226	-.2144	+8.8741	.9988
	36 Sextantis	6	+38	-38	5 56.4	- 7 39 19	-0.0142	.5225	-.2149	+8.7473	.9993
	B.A.C. 3726	6	+90	+ 3	9 35.3	- 4 7 0	+0.7665	.5230	-.2158	+8.4846	.9998
	55 Leonis	6	+88	- 1	11 22.3	- 2 23 6	+0.6887	.5231	-.2163	+8.4670	9.9999
	p ² Leonis	6	+78	- 7	15 26.8	+ 1 34 8	+0.5909	.5236	-.2169	+8.1160	0.0000
	p ³ Leonis	5	+13	-68	20 38.8	+ 6 36 52	-0.4739	.5241	-.2175	+8.0685	0.0000
	e Leonis	5	+88	+ 6	5 5.6	- 9 11 31	+0.8174	.5258	-.2177	-8.5945	9.9997
	B.A.C. 4006	6	+86	+19	15 34.5	+ 0 58 23	+1.0193	.5277	-.2161	-8.9019	.9986
	q Virginis	6	+82	+11	12 45.5	- 2 29 53	+0.8859	.5354	-.2073	-9.1796	.9950
	x Virginis	5	-37	-90	15 25.6	+ 0 5 10	-1.2006	.5362	-.2056	-9.1008	.9965
	B.A.C. 4259	6	-36	-90	15 29.3	+ 0 8 48	-1.1730	.5362	-.2055	-9.1029	.9965
	B.A.C. 4312	6 $\frac{1}{2}$	+41	-34	21 16.0	+ 5 44 29	+0.0897	.5393	-.2017	-9.2219	.9939
	ψ Virginis	5	-24	-90	22 42.0	+ 7 7 46	-1.0394	.5399	-.2005	-9.1844	.9949
	g Virginis	6	-24	-90	5 8.3	-10 38 26	-1.0361	.5430	-.1953	-9.2402	.9934
	i Virginis	5	0	-84	13 57.3	- 2 6 39	-0.6372	.5478	-.1865	-9.3178	.9904
	B.A.C. 4531	6	- 9	-90	17 37.5	+ 1 26 10	-0.7734	.5497	-.1825	-9.3357	.9896
	85 Virginis	6	+75	+20	22 35.4	+ 6 14 6	+1.0130	.5532	-.1768	-9.4152	.9848
	B.A.C. 4700	5 $\frac{1}{2}$	+14	-58	9 55.5	- 6 49 5	-0.3142	.5605	-.1617	-9.4311	.9836
	γ Libræ	4 $\frac{1}{2}$	+11	-55	12 15.1	- 5 26 12	-0.2695	.5776	-.1167	-9.5186	.9750
	δ Libræ	6 $\frac{1}{2}$	+ 1	-70	12 42.8	- 4 59 31	-0.4719	0.5781	-.1155	-9.5154	9.9754

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Feb. 11	B. A. C. 5281	6	-19	-90	6 56.1	-11 27 44	-0.7411	0.5888	-0.0768	-9.5460	9.9714
11	δ Scorpii	2 $\frac{1}{2}$	+68	+12	7 50.1	-10 35 46	+0.8668	.5899	-0.0746	-9.5778	.9664
11	ω^2 Scorpii	4 $\frac{1}{2}$	-44	-90	10 41.7	-7 50 53	-1.0990	.5910	-0.0631	-9.5442	.9716
11	B. A. C. 5395	6	-17	-90	13 11.3	-5 27 8	-0.6988	.5925	-0.0621	-9.5553	.9700
11	ϵ Ophiuchi	5	+67	+36	17 50.7	-0 58 43	+1.1455	.5940	-0.0508	-9.5942	.9636
11	ω Ophiuchi	5	-36	-90	20 27.8	+1 32 13	-0.9605	.5957	-0.0443	-9.5576	.9697
12	22 Ophiuchi	6 $\frac{1}{2}$	+67	+14	5 17.1	+10 0 20	+0.8808	.5995	-0.0229	-9.5969	.9631
12	24 Ophiuchi	6 $\frac{1}{2}$	+48	-10	6 3.1	+10 44 30	+0.5069	.5995	-0.0203	-9.5906	.9642
12	B. A. C. 5758	6	-51	-90	9 43.8	-9 43 40	-1.1215	.6006	-0.0105	-9.5616	.9691
12	B. A. C. 5866	6	-58	-90	16 51.7	-2 53 4	-1.1918	.6023	+0.0078	-9.5604	.9692
12	B. A. C. 5954	6	-15	-82	22 15.6	+2 17 42	-0.5921	.6032	+0.0217	-9.5703	.9677
13	58 Ophiuchi	5	-25	-90	0 4.0	+4 1 44	-0.7643	.6033	+0.0264	-9.5662	.9683
13	B. A. C. 6088	6	+61	-1	7 7.3	+10 47 50	+0.6513	.6038	+0.0447	-9.5878	.9648
13	μ^1 Sagittarii	4	-24	-90	11 42.9	-8 47 51	-0.7984	.6037	+0.0569	-9.5561	.9699
13	14 Sagittarii	6	+13	-47	11 53.6	-8 37 34	-0.1335	.6037	+0.0571	-9.5688	.9679
13	15 Sagittarii	5	-45	-90	12 16.7	-8 15 21	-1.0907	.6037	+0.0581	-9.5497	.9708
13	21 Sagittarii	5	-36	-90	16 10.7	-4 30 52	-0.9079	.6034	+0.0681	-9.5466	.9713
14	B. A. C. 6336	6 $\frac{1}{2}$	+36	-24	20 59.7	+0 6 23	+0.2549	.6027	+0.0802	-9.5642	.9687
14	B. A. C. 6347	6 $\frac{1}{2}$	+19	-42	21 23.3	+0 29 3	-0.0578	.6027	+0.0815	-9.5575	.9697
14	29 Sagittarii	6	+3	-63	1 33.9	+4 29 27	-0.3797	.6019	+0.0915	-9.5439	.9716
14	33 Sagittarii	6	+69	+9	3 13.1	+6 4 44	+0.8160	.6017	+0.0954	-9.5645	.9686
14	ξ^1 Sagittarii	6	+38	-24	4 31.9	+7 20 16	+0.2549	.6013	+0.0988	-9.5510	.9706
14	ξ^2 Sagittarii	4	+69	+2	4 40.1	+7 28 11	+0.7178	.6012	+0.0990	-9.5599	.9693
14	B. A. C. 6336	6 $\frac{1}{2}$	-9	-85	8 48.9	+11 26 58	-0.6246	.6002	+0.1089	-9.5235	.9743
14	B. A. C. 6339	6	+69	+28	8 53.3	+11 31 14	+1.0735	.6002	+0.1089	-9.5583	.9696
14	π Sagittarii	3	+69	+38	9 21.3	+11 58 5	+1.1620	.5999	+0.1098	-9.5590	.9696
14	δ Sagittarii	5	-2	-74	12 28.6	-9 2 3	-0.5172	.5990	+0.1172	-9.5169	.9751
14	ϵ^2 Sagittarii	5 $\frac{1}{2}$	-28	-90	14 8.1	-7 26 31	-0.9517	.5985	+0.1201	-9.5028	.9768
14	B. A. C. 6658	6	-4	-79	16 35.4	-5 5 7	-0.5736	.5963	+0.1266	-9.5045	.9766
15	B. A. C. 6992	6 $\frac{1}{2}$	-16	-90	13 43.5	-8 46 29	-0.8412	.5883	+0.1683	-9.4190	.9845
15	β Capricor.	3	-15	-90	13 49.3	-8 40 55	-0.8273	.5882	+0.1686	-9.4189	.9845
15	γ^1 Capricor.	6	+74	+3	20 30.2	-2 15 17	+0.7411	.5845	+0.1796	-9.4302	.9837
15	γ^2 Capricor.	5	+75	0	21 18.1	-1 29 9	+0.7009	.5844	+0.1807	-9.4251	.9841
18	B. A. C. 8152	6 $\frac{1}{2}$	+90	+35	21 34.5	-3 45 47	+1.2117	.5513	+0.2273	-7.9653	0.0000
18	α Piscium	4 $\frac{1}{2}$	+77	-7	23 9.3	-2 14 9	+0.5847	.5509	+0.2273	-7.9467	.0000
18	9 Piscium	6	+90	+3	23 18.1	-2 5 37	+0.7571	.5508	+0.2272	-7.8105	0.0000
19	16 Piscium	6	+90	+1	3 33.6	+2 1 22	+0.7278	.5498	+0.2260	-8.3703	9.9999
20	d Piscium	5 $\frac{1}{2}$	-16	-83	0 15.5	-1 57 27	-0.9618	.5455	+0.2150	-9.1116	.9963
20	45 Piscium	6	+42	-34	2 39.6	+0 21 55	+0.0653	.5453	+0.2132	-9.0819	.9968
21	101 Piscium	6	+6	-70	11 45.3	+8 23 12	-0.7679	.5424	+0.1787	-9.3825	.9870
21	104 Piscium	6 $\frac{1}{2}$	+34	-38	13 23.9	+9 58 41	-0.0851	.5431	+0.1768	-9.3710	.9877
22	27 Arietis	6	+42	-26	13 43.1	+9 30 29	+0.0636	.5441	+0.1418	-9.4683	.9804
22	B. A. C. 782	6 $\frac{1}{2}$	-23	-72	14 57.9	+10 42 49	-1.0266	.5442	+0.1401	-9.4963	.9775
22	40 Arietis	6	+73	0	21 59.2	-6 29 36	+0.5201	.5446	+0.1287	-9.4832	.9789
23	ϵ^2 Arietis	6	+90	+22	1 24.0	-3 11 32	+0.8839	.5450	+0.1227	-9.4847	.9788
23	ϵ^1 Arietis	6	+90	+53	1 40.7	-2 55 25	+1.2422	.5450	+0.1224	-9.4775	.9795
23	54 Arietis	6 $\frac{1}{2}$	+90	+35	7 15.6	+2 28 30	+1.0452	.5454	+0.1133	-9.4962	.9775
23	δ Arietis	4 $\frac{1}{2}$	+50	-15	8 46.0	+3 55 59	+0.1947	.5455	+0.1105	-9.5172	.9751
23	ζ Arietis	4 $\frac{1}{2}$	-29	-70	10 16.9	+5 23 56	-1.0824	.5456	+0.1076	-9.5450	.9715
23	B. A. C. 1032	6 $\frac{1}{2}$	+26	-37	13 4.5	+8 5 58	-0.2207	.5456	+0.1027	-9.5343	.9729
23	γ^1 Arietis	5	-14	-70	13 13.9	+8 15 3	-0.9001	.5459	+0.1026	-9.5474	.9712
23	γ^2 Arietis	6	+17	-48	13 57.6	+8 57 20	-0.3903	.5456	+0.1013	-9.5392	.9723
23	65 Arietis	6	+17	-47	14 44.3	+9 42 30	-0.3825	.5459	+0.0995	-9.5405	.9721
23	MARS	4	+66	-1	15 26.7	+10 23 35	+0.4330	.5212	+0.0918	-9.5263	.9740
24	32 Tauri	6	-24	-68	5 48.8	+0 17 15	-1.0165	0.5464	+0.0720	-9.5751	9.9669

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of Conj.	At Washington Mean Time of Conjunction.						
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D	
					h m s	h m s						
Feb. 24	A ¹ Tauri	4½	+18	-42	9 27.9	+ 3 49 6	-0.3544	0.5465	+0.0652	+9.5680	9.9681	
24	A ² Tauri	6	+24	-36	9 45.5	+ 4 6 11	-0.2613	.5466	+0.0645	+9.5667	.9683	
24	53 Tauri	6½	+90	+40	16 21.1	+10 28 40	+1.0342	.5468	+0.0524	+9.5566	.9707	
24	56 Tauri	6½	+60	- 2	16 25.1	+10 32 36	+0.3434	.5468	+0.0513	+9.5629	.9689	
24	α ¹ Tauri	5½	+31	-26	19 4.5	-10 53 18	-0.1144	.5470	+0.0488	+9.5731	.9672	
24	α ² Tauri	6½	+38	-20	19 6.1	-10 51 43	-0.0107	.5469	+0.0488	+9.5714	.9675	
24	ν ¹ Tauri	5	0	-63	19 30.0	-10 28 37	-0.6693	.5469	+0.0461	+9.5828	.9656	
24	ν ² Tauri	6	-12	-68	19 57.8	-10 1 46	-0.8511	.5468	+0.0454	+9.5862	.9650	
25	τ Tauri	4½	+ 5	-56	2 55.3	- 3 18 2	-0.5913	.5468	+0.0319	+9.5863	.9650	
25	ε Tauri	5	+90	+46	12 40.1	+ 6 7 28	+1.0610	.5464	+0.0129	+9.5619	.9690	
25	105 Tauri	6	+90	+38	14 55.4	+ 8 18 18	+0.9421	.5463	+0.0086	+9.5645	.9686	
25	URANUS		+ 6	-51	16 3.3	+ 9 24 1	-0.5614	.5461	+0.0057	+9.5897	.9644	
25	π Tauri	6	+71	+11	20 12.8	-10 34 44	+0.4844	.5460	-0.0016	+9.5726	.9673	
26	ο Tauri	6	+84	+17	0 7.6	- 6 47 35	+0.6125	.5455	-0.0092	+9.5701	.9677	
26	B.A.C. 1774	6½	-28	-67	5 31.8	- 1 34 5	-1.0406	.5451	-0.0198	+9.5701	.9677	
26	141 Tauri	6	+15	-44	16 6.9	+ 8 40 14	-0.4188	.5440	-0.0398	+9.5809	.9659	
26	B.A.C. 1970	6½	+17	-41	19 49.4	-11 44 28	-0.3753	.5438	-0.0469	+9.5775	.9665	
26	6 Geminor.	6	-51	-67	21 7.0	-10 29 23	-1.2411	.5434	-0.0491	+9.5907	.9642	
26	γ Geminor.	4	-13	-68	22 20.8	- 9 18 1	-0.8688	.5434	-0.0514	+9.5836	.9655	
27	μ Geminor.	3	-34	-68	2 10.1	- 5 36 5	-1.1200	.5426	-0.0586	+9.5844	.9654	
27	15 Geminor.	6	+86	+13	4 30.9	- 3 19 53	+0.6314	.5423	-0.0629	+9.5518	.9705	
27	16 Geminor.	6	+90	+33	4 36.2	- 3 14 45	+0.9637	.5422	-0.0631	+9.5458	.9714	
27	ν Geminor.	4	+90	+58	5 5.6	- 2 46 17	+1.2317	.5425	-0.0638	+9.5401	.9722	
27	ζ Geminor.	4	+ 4	-63	21 54.6	-10 29 40	-0.6179	.5391	-0.0552	+9.5497	.9708	
28	B.A.C. 2432	6½	+90	+26	7 9.4	- 1 32 32	+0.9166	.5374	-1.089	+9.5022	.9769	
28	f Geminor.	6	+81	+ 5	15 9.5	+ 6 12 27	+0.6009	.5357	-0.1216	+9.4896	.9782	
28	g Geminor.	5½	- 4	-68	18 23.9	+ 9 20 47	-0.7475	.5351	-0.1268	+9.5002	.9761	
Mar. 1	1 Cancri	6	+15	-54	1 38.3	- 7 38 24	-0.4227	.5337	-0.1374	+9.4825	.9790	
1	5 Cancri	6	+68	- 4	2 0.7	- 7 16 38	+0.4617	.5336	-0.1378	+9.4618	.9810	
1	B.A.C. 2731	6½	- 4	-73	6 12.4	- 3 12 49	-0.7718	.5333	-0.1437	+9.4761	.9796	
1	29 Cancri	6	+90	+16	15 31.4	+ 5 48 58	+0.8566	.5311	-0.1563	+9.4033	.9856	
1	A ¹ Cancri	6	+90	+59	22 51.0	-11 4 55	+1.3098	.5300	-0.1654	+9.3575	.9884	
2	α Cancri	4	+90	+14	6 32.8	- 3 37 10	+0.8568	.5286	-0.1743	+9.3312	.9898	
2	π Cancri	5	+90	+53	11 14.9	+ 0 56 18	+1.2999	.5282	-0.1793	+9.2889	.9916	
2	B.A.C. 3122	6½	+46	-27	12 15.3	+ 1 54 52	+0.1344	.5284	-0.1804	+9.3219	.9902	
2	ω Leonis	6	+90	+25	21 45.5	+11 7 55	+1.0619	.5271	-0.1897	+9.2241	.9938	
2	λ Leonis	6	+38	-36	23 31.9	-11 8 57	+0.0002	.5269	-0.1913	+9.2529	.9929	
3	ο Leonis	3½	-28	-80	4 12.8	- 6 36 29	-1.1174	.5269	-0.1952	+9.2610	.9926	
3	B.A.C. 3407	6	-32	-81	12 51.4	+ 1 46 34	-1.1532	.5264	-0.2017	+9.1925	.9947	
3	π Leonis	5	-25	-82	13 56.2	+ 2 49 24	-1.0837	.5264	-0.2024	+9.1795	.9950	
3	14 Sextantis	6	+90	+ 8	17 19.4	+ 6 6 27	+0.8422	.5264	-0.2046	+9.0385	.9974	
3	16 Sextantis	6	+37	-38	18 33.8	+ 7 18 39	-0.0201	.5263	-0.2055	+9.0757	.9969	
4	34 Sextantis	6	- 9	-86	11 34.9	- 0 10 58	-0.8541	.5275	-0.2138	+8.742	.9988	
4	36 Sextantis	6	+40	-36	12 52.3	+ 1 4 10	+0.0372	.5276	-0.2143	+8.7473	.9993	
4	B.A.C. 3726	6	+90	+ 7	16 27.9	+ 4 33 12	+0.8226	.5280	-0.2153	+8.4844	.9998	
4	55 Leonis	6	+90	+ 3	18 13.2	+ 6 15 23	+0.7499	.5283	-0.2158	+8.4068	9.9909	
4	p ² Leonis	6	+85	- 3	22 13.9	+10 8 46	+0.6625	.5287	-0.2166	+8.1058	0.0000	
5	p ¹ Leonis	5	+18	-61	3 20.8	- 8 53 36	-0.3831	.5295	-0.2173	+8.6681	0.0000	
5	e Leonis	5	+88	+13	11 38.9	- 0 50 47	+0.9200	.5314	-0.2176	+8.5947	9.9997	
5	B.A.C. 4006	6	+86	+29	21 56.5	+ 9 7 51	+1.1442	.5342	-0.2162	+8.0020	.9986	
6	q Virginis	6	+82	+23	18 44.3	+ 5 16 22	+1.0573	.5418	-0.2077	+9.1797	.9950	
6	χ Virginis	5	-21	-90	21 21.5	+ 7 48 30	-1.0104	.5429	-0.2062	+9.1008	.9965	
6	B.A.C. 4259	6	-19	-90	21 25.2	+ 7 52 8	-0.9838	.5431	-0.2060	+9.1030	.9965	
7	B.A.C. 4312	6½	+52	-23	3 5.9	-10 38 12	+0.2831	.5455	-0.2021	+9.2220	.9939	
7	ψ Virginis	5	-10	-90	4 30.4	- 9 16 25	-0.8364	0.5461	-0.2010	+9.1845	9.9949	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Mar. 7	γ Virginis	6	-10	-90	10 50.5	-3 8 50	-0.8228	0.5492	-1.954	-9.2402	9.9334
7	ϵ Virginis	5	+12	-64	10 31.7	+5 15 2	-0.4125	.5536	-1.868	-9.3179	.9904
7	B.A.C. 4531	6	+4	-74	23 8.9	+8 44 53	-0.5425	.5555	-1.827	-9.3358	.9896
8	δ Virginis	6	+75	+43	4 3.0	-10 30 56	+1.2437	.5581	-1.768	-9.4153	.9848
8	B.A.C. 4670	6½	-26	-90	12 23.5	-2 22 56	-0.9965	.5630	-1.654	-9.3930	.9863
8	B.A.C. 4700	5½	+27	-42	15 16.2	+0 18 56	-0.0634	.5632	-1.614	-9.4312	.9836
9	B.A.C. 4896	6	-33	-90	8 50.5	-6 44 27	-1.0366	.5740	-1.323	-9.4714	.9801
9	ι Libræ	4½	+26	-38	17 29.6	+1 35 36	-0.0017	.5788	-1.158	-9.5187	.9750
9	θ Libræ	6½	+15	-50	17 57.4	+2 2 19	-0.2043	.5788	-1.152	-9.5155	.9754
10	B.A.C. 5109	6½	-32	-90	1 56.4	+9 43 27	-0.9802	.5818	-0.989	-9.5171	.9751
10	λ Libræ	6	-50	-90	10 23.8	-6 8 22	-1.1695	.5867	-0.902	-9.5239	.9737
10	B.A.C. 5281	6	-3	-70	12 16.2	-4 20 20	-0.4711	.5873	-0.767	-9.5460	.9714
10	δ Scorpii	2½	+68	+36	13 10.9	+3 27 45	+1.1445	.5878	-0.741	-9.5778	.9664
10	ω Scorpii	4½	-38	-90	15 50.2	-0 54 34	-1.0198	.5888	-0.680	-9.5401	.9722
10	ω Scorpii	4½	-25	-90	16 4.1	-0 41 9	-0.8310	.5888	-0.675	-9.5442	.9716
10	B.A.C. 5395	6	-3	-66	18 35.4	+1 44 16	-0.4287	.5901	-0.614	-9.5553	.9700
11	ω Ophiuchi	5	-19	-90	1 57.7	+8 49 26	-0.6940	.5916	-0.444	-9.5576	.9697
11	22 Ophiuchi	6½	+67	+38	10 55.8	-6 33 34	-1.1582	.5943	-0.225	-9.5669	.9631
11	24 Ophiuchi	6½	+67	+7	11 42.7	-5 48 30	+0.7814	.5946	-0.203	-9.5806	.9642
11	B.A.C. 5753	6	-32	-90	15 27.6	-2 12 29	-0.8630	.5952	-0.109	-9.5616	.9691
12	B.A.C. 5866	6	-38	-90	22 45.1	+4 47 44	-0.9387	.5959	+0.071	-9.5604	.9692
12	B.A.C. 5954	6	-1	-60	4 16.3	+10 5 50	-0.3376	.5962	+0.207	-9.5703	.9677
12	58 Ophiuchi	5	-10	-74	6 7.4	+11 52 33	-0.5124	.5961	+0.255	-9.5662	.9683
12	B.A.C. 6088	6	+67	+16	13 21.9	-5 10 10	+0.9128	.5959	+0.435	-9.5878	.9648
12	B.A.C. 6098	6	-50	-90	13 41.8	-4 51 3	-1.1374	.5958	+0.444	-9.5490	.9707
12	μ Sagittarii	4	-10	-78	18 5.0	-0 38 13	-0.5582	.5953	+0.549	-9.5561	.9699
12	14 Sagittarii	6	+32	-32	18 16.1	-0 27 37	+0.1147	.5952	+0.554	-9.5688	.9679
12	15 Sagittarii	5	-27	-90	18 39.9	-0 4 43	-0.8551	.5952	+0.564	-9.5497	.9708
12	16 Sagittarii	6	-55	-90	18 40.5	-0 4 8	-1.1987	.5951	+0.564	-9.5428	.9718
13	21 Sagittarii	5	-21	-90	22 40.7	+3 46 36	-0.7652	.5948	+0.660	-9.5466	.9713
13	B.A.C. 6336	6½	+52	-10	3 38.4	+8 32 34	+0.4984	.5940	+0.779	-9.5642	.9687
13	B.A.C. 6347	6½	+32	-28	4 2.8	+8 56 2	+0.1810	.5938	+0.788	-9.5575	.9697
13	29 Sagittarii	6	+15	-47	8 21.0	-10 55 49	-0.1505	.5925	+0.886	-9.5439	.9716
13	33 Sagittarii	6	+69	+27	10 3.4	-9 17 24	+1.0595	.5921	+0.926	-9.5645	.9686
13	ξ Sagittarii	6	+53	-11	11 24.6	-7 59 22	+0.4890	.5916	+0.958	-9.5510	.9706
13	ζ Sagittarii	4	+69	+19	11 33.1	-7 51 13	+0.9583	.5916	+0.960	-9.5509	.9693
13	B.A.C. 6536	6½	+3	-65	15 49.9	-3 44 26	-0.4090	.5905	+1.056	-9.5235	.9743
13	d Sagittarii	5	+9	-57	19 36.8	-0 6 15	-0.3058	.5891	+1.139	-9.5169	.9751
13	ρ Sagittarii	4	-51	-90	21 16.4	+1 29 28	-1.2151	.5886	+1.172	-9.4923	.9780
13	ϵ Sagittarii	5½	-15	-90	21 19.5	+1 32 29	-0.7480	.5886	+1.172	-9.5028	.9768
13	B.A.C. 5658	6	+6	-61	23 51.6	+3 58 43	-0.3690	.5879	+1.226	-9.5045	.9766
14	B.A.C. 6992	6½	-6	-90	21 41.3	+0 59 6	-0.6794	.5789	+1.634	-9.4190	.9845
14	β Capricor.	3	-5	-88	21 47.3	+1 4 49	-0.6658	.5788	+1.636	-9.4189	.9845
15	ι Capricor.	6	+75	+14	4 40.9	+7 43 11	+0.9114	.5757	+1.746	-9.4302	.9837
15	τ Capricor.	5	+75	+11	5 30.3	+8 30 46	+0.8680	.5752	+1.758	-9.4251	.9841
15	B.A.C. 7221	6½	-3	-86	10 25.2	-10 45 5	-0.6571	.5731	+1.828	-9.3537	.9886
15	8 Aquarii	6	+72	-5	14 23.0	-6 55 52	+0.6137	.5712	+1.881	-9.3707	.9877
15	9 Aquarii	6	+76	+37	14 54.1	-6 25 53	+1.1981	.5712	+1.886	-9.3856	.9868
15	ν Aquarii	4½	+20	-53	18 35.5	-2 52 21	-0.2559	.5695	+1.932	-9.3152	.9905
16	17 Aquarii	6	-34	-90	0 27.3	+2 46 57	-1.1468	.5672	+1.999	-9.2354	.9935
16	19 Aquarii	6	+7	-72	1 26.6	+3 44 10	-0.5162	.5669	+2.010	-9.2637	.9899
16	ξ Aquarii	4½	-46	-90	6 59.3	+9 5 10	-1.2720	.5648	+2.063	-9.1690	.9952
16	ϵ Capricor.	6	+78	-3	10 11.8	-11 49 6	+0.6529	.5631	+2.091	-9.2270	.9937
16	ϵ Capricor.	6½	+80	+17	10 45.3	-11 16 42	+0.9690	.5629	+2.097	-9.2356	.9935
16	30 Aquarii	5½	+28	-48	18 23.8	-3 54 4	-0.1662	.5601	+2.153	-9.0971	9.9966

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Mar. 17	44 Aquarii	6	+41	-35	^{h m} 0 39.3	^{h m s} + 2 8 33	+0.0636	0.5578	+2189	-9.0241	9.9976
17	51 Aquarii	6	+50	-27	3 50.3	+ 5 13 5	+0.2142	.5509	+2203	-8.9838	.9960
20	101 Piscium	6	-16	-76	21 11.3	- 4 22 42	-0.9554	.5484	+1.789	+9.3825	.9870
21	27 Arietis	6	+29	-39	22 47.3	+10 22 33	-0.1705	.5503	+1.420	+9.4683	.9804
22	40 Arietis	6	+55	-13	6 55.7	+ 4 14 48	+0.2717	.5508	+1.287	+9.4832	.9789
22	π Arietis	5½	+90	+47	7 17.8	+ 4 36 7	+1.1992	.5508	+1.280	+9.4632	.9808
22	ρ^a Arietis	6	+84	+ 7	10 17.5	+ 7 29 53	+0.6295	.5509	+1.230	+9.4847	.9788
22	ρ^b Arietis	6	+90	+29	10 33.8	+ 7 45 36	+0.9849	.5509	+1.225	+9.4775	.9795
22	54 Arietis	6½	+90	+17	16 3.5	-10 55 37	+0.7823	.5514	+1.129	+9.4962	.9775
22	δ Arietis	4½	+35	-29	17 32.6	- 9 29 33	-0.0647	.5513	+1.103	+9.5172	.9751
22	B.A.C. 1032	6½	+10	-55	21 47.1	- 5 23 29	-0.4818	.5512	+1.026	+9.5343	.9729
22	r^1 Arietis	5	-37	-70	21 56.4	- 5 14 30	-1.1574	.5514	+1.024	+9.5474	.9712
22	r^2 Arietis	6	+ 1	-66	22 39.5	- 4 32 52	-0.6514	.5516	+1.012	+9.5392	.9723
22	65 Arietis	6	+ 2	-65	23 25.5	- 3 48 23	-0.6446	.5516	+0.997	+9.5405	.9721
23	A ¹ Tauri	4½	+ 2	-62	17 53.5	- 9 57 26	-0.6323	.5516	+0.9652	+9.5680	.9681
23	A ² Tauri	6	+ 8	-54	18 11.0	- 9 40 30	-0.5403	.5516	+0.9646	+9.5667	.9683
24	53 Tauri	6½	+90	+21	0 41.7	- 3 22 54	+0.7442	.5512	+0.9519	+9.5506	.9707
24	56 Tauri	6½	+41	-17	0 45.7	- 3 18 59	+0.8569	.5512	+0.9518	+9.5629	.9689
24	κ^1 Tauri	5½	+16	-43	3 23.3	- 0 46 42	-0.4002	.5512	+0.9467	+9.5731	.9672
24	κ^2 Tauri	6½	+21	-36	3 24.9	- 0 45 9	-0.2973	.5512	+0.9466	+9.5714	.9675
24	ν^1 Tauri	5	-19	-68	3 48.5	- 0 22 21	-0.9521	.5511	+0.9459	+9.5828	.9656
24	ν^2 Tauri	6	-36	-68	4 15.9	+ 0 4 12	-1.1334	.5511	+0.9452	+9.5862	.9650
24	τ Tauri	4½	-14	-68	11 9.1	+ 6 43 34	-0.8778	.5506	+0.9317	+9.5863	.9650
24	ι Tauri	5	+90	+26	20 48.8	- 7 56 3	+0.7645	.5495	+0.9127	+9.5619	.9690
24	105 Tauri	6	+88	+19	23 3.0	- 5 46 18	+0.6454	.5492	+0.9084	+9.5645	.9686
25	URANUS		-14	-67	0 58.4	- 3 54 40	-0.8804	.5478	+0.9048	+9.5905	.9643
25	η Tauri	6	+50	- 5	4 18.3	- 0 41 26	+0.1891	.5485	-0.0015	+9.5726	.9673
25	θ Tauri	6	+58	+ 1	8 11.8	+ 3 4 21	+0.3167	.5479	-0.0092	+9.5701	.9677
25	ζ Tauri	3½	+90	+48	12 53.2	+ 7 36 29	+1.0922	.5469	-0.183	+9.5554	.9700
26	141 Tauri	6	- 3	-67	0 7.6	- 5 31 13	-0.7104	.5446	-0.397	+9.5809	.9659
26	B.A.C. 1970	6½	- 1	-64	3 49.9	- 1 56 14	-0.6661	.5439	-0.0465	+9.5775	.9695
26	η Geminor.	4	-28	-68	6 21.1	+ 0 30 4	-1.1582	.5435	-0.0510	+9.5836	.9655
26	15 Geminor.	6	+60	- 3	12 31.3	+ 6 28 14	+0.3416	.5420	-0.0624	+9.5518	.9705
26	16 Geminor.	6	+90	+15	12 36.5	+ 6 33 21	+0.6635	.5420	-0.0626	+9.5458	.9714
26	ν Geminor.	4	+90	+32	13 6.0	+ 7 1 50	+0.9412	.5417	-0.0632	+9.5401	.9722
27	ζ Geminor.	4	-15	-69	5 57.4	- 0 39 9	-0.8966	.5378	-0.0923	+9.5497	.9708
27	B.A.C. 2432	6½	+87	+9	15 14.7	+ 8 20 33	+0.6443	.5354	-0.1075	+9.5022	.9769
27	f Geminor.	6	+59	-9	23 17.4	- 7 51 51	+0.3355	.5337	-0.1199	+9.4896	.9782
28	g Geminor.	5½	-22	-71	2 33.0	- 4 42 21	-1.0102	.5328	-0.1248	+9.5092	.9761
28	1 Cancri	6	+90	+53	7 59.5	+ 0 34 0	+1.2520	.5316	-0.1327	+9.4444	.9825
28	3 Cancri	6	0	-71	9 50.1	+ 2 21 15	-0.6774	.5313	-0.1354	+9.4825	.9790
28	5 Cancri	6	+51	-18	10 12.7	+ 2 43 5	+0.2082	.5312	-0.1358	+9.4618	.9810
28	B.A.C. 2731	6½	-23	-73	14 26.0	+ 6 48 38	-1.0209	.5303	-0.1418	+9.4761	.9796
28	23 Cancri	6	+83	+ 2	23 49.0	- 8 5 40	+0.6220	.5286	-0.1541	+9.4033	.9856
29	B.A.C. 2872	6½	+90	+48	2 24.9	- 5 34 31	+1.2448	.5281	-0.1573	+9.3752	.9874
29	A ¹ Cancri	6	+90	+31	7 11.5	- 0 56 37	+1.0862	.5274	-0.1629	+9.3575	.9884
29	60 Cancri	6	+90	+34	13 38.9	+ 5 19 2	+1.1280	.5265	-0.1703	+9.3230	.9902
29	α Cancri	4	+85	+ 2	14 56.2	+ 6 34 2	+0.6465	.5264	-0.1716	+9.3313	.9898
29	κ Cancri	5	+90	+31	19 39.9	+11 9 12	+1.0975	.5260	-0.1767	+9.2889	.9916
29	B.A.C. 3122	6½	+35	-38	20 40.7	-11 51 51	-0.0668	.5259	-0.1777	+9.3219	.9902
30	ω Leonis	6	+90	+14	6 13.9	- 2 35 55	+0.8782	.5252	-0.1869	+9.2241	.9938
30	λ Leonis	6	+28	-45	8 0.6	- 0 52 20	-0.1798	.5252	-0.1885	+9.2529	.9929
30	σ Leonis	3½	-46	-80	12 42.6	+ 3 41 7	-1.2668	.5251	-0.1926	+9.2610	.9926
30	B.A.C. 3407	6	-49	-81	21 23.1	-11 53 58	-1.3062	.5252	-0.1992	+9.1925	.9947
30	π Leonis	5	-39	-81	22 27.4	-10 51 32	-1.2320	0.5252	-0.1999	+9.1794	9.9950

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
					h m	h m s					
Mar. 31	14 Sextantis	6	+90	+1	1 50.8	- 7 34 16	+0.6990	0.5254	-.2022	+9.0385	9.9974
31	16 Sextantis	6	+30	-46	3 5.4	- 6 21 52	-0.1595	.5255	-.2029	+9.0757	9.969
31	34 Sextantis	6	-15	-86	20 5.1	+10 7 7	-0.9517	.5277	-.2115	-8.8741	9.9988
31	36 Sextantis	6	+35	-41	21 22.3	+11 21 57	-0.0597	.5280	-.2120	+8.7474	9.993
Apr. 1	B.A.C. 3726	6	+90	+2	0 56.9	- 9 9 53	+0.7318	.5287	-.2132	+8.4844	9.998
1	55 Leonis	6	+85	-2	2 41.8	- 7 28 16	+0.6632	.5290	-.2137	+8.4067	9.9999
1	p ³ Leonis	6	+77	-7	6 41.0	- 3 36 18	+0.5865	.5302	-.2148	+8.1057	0.0000
1	ε ³ Leonis	5	+14	-65	11 45.7	+ 1 19 6	-0.4420	.5316	-.2157	+8.0732	0.0000
1	ε ³ Leonis	5	+88	+10	19 59.4	+ 9 17 32	+0.8758	.5342	-.2160	-8.5347	9.9997
2	B.A.C. 4006	6	+86	+28	6 10.1	- 4 50 45	+1.1236	.5380	-.2152	-8.9020	9.986
3	q Virginis	6	+81	+26	2 38.7	- 9 1 30	+1.0879	.5473	-.2074	-9.1797	9.950
3	χ Virginis	5	-18	-90	5 13.1	- 6 32 8	-0.9581	.5487	-.2058	-9.1008	9.965
3	B.A.C. 4259	6	-16	-90	5 16.8	- 6 28 33	-0.9315	.5488	-.2056	-9.1030	9.965
3	B.A.C. 4312	6½	+55	-20	10 51.1	- 1 5 18	+0.3380	.5517	-.2018	-9.2220	9.939
3	ψ Virginis	5	-6	-90	12 13.9	+ 0 14 45	-0.7681	.5523	-.2008	-9.1845	9.949
3	g Virginis	6	-5	-90	18 26.2	+ 6 14 34	-0.7394	.5554	-.1955	-9.2400	9.934
4	i Virginis	5	+17	-57	2 56.2	- 9 32 46	-0.3142	.5608	-.1870	-9.3179	9.904
4	B.A.C. 4531	6	+10	-65	6 28.6	- 6 7 46	-0.4353	.5631	-.1828	-9.3358	9.896
4	B.A.C. 4679	6½	-16	-90	19 29.7	+ 6 25 52	-0.8574	.5708	-.1656	-9.3931	9.863
4	B.A.C. 4700	5½	+34	-34	22 13.5	+ 9 3 50	+0.0711	.5724	-.1618	-9.4312	9.836
5	B.A.C. 4896	6	-21	-90	15 23.0	+ 1 35 36	-0.8620	.5824	-.1325	-9.4714	9.801
5	λ ¹ Libræ	4½	+35	-23	23 50.3	+ 9 43 48	+0.1754	.5868	-.1159	-9.5187	9.750
6	λ ³ Libræ	6½	+24	-39	0 17.5	+10 9 53	-0.0243	.5870	-.1151	-9.5155	9.754
6	B.A.C. 5109	6½	-19	-90	8 6.1	- 6 19 25	-0.7820	.5906	-.0986	-9.5171	9.751
6	κ ³ Libræ	5	-43	-90	11 51.1	- 2 43 6	-1.1046	.5921	-.0903	-9.5178	9.751
6	λ ¹ Libræ	6	-32	-90	16 23.2	+ 1 38 23	-0.9596	.5940	-.0799	-9.5289	9.737
6	B.A.C. 5281	6	+8	-54	18 13.4	+ 3 24 17	-0.2655	.5944	-.0760	-9.5460	9.714
6	ω ¹ Scorpii	4½	-23	-90	21 43.4	+ 6 46 4	-0.8068	.5957	-.0675	-9.5401	9.722
6	ω ³ Scorpii	4½	-12	-84	21 57.1	+ 6 59 14	-0.6193	.5958	-.0674	-9.5442	9.716
7	B.A.C. 5395	6	+9	-51	0 25.7	+ 9 21 57	-0.2174	.5966	-.0611	-9.5553	9.700
7	ω Ophiuchi	5	-7	-70	7 40.7	- 7 40 14	-0.4746	.5980	-.0437	-9.5576	9.697
7	24 Ophiuchi	6½	+67	+23	17 17.3	+ 1 33 30	+0.9995	.5992	-.0199	-9.5906	9.642
7	B.A.C. 5758	6	-18	-86	20 59.6	+ 5 6 52	-0.6330	.5996	-.0106	-9.5616	9.691
8	ξ Ophiuchi	5	-47	-90	2 45.9	+10 39 22	-1.0656	.5998	+0.0042	-9.5336	9.702
8	B.A.C. 5866	6	-23	-90	4 11.7	-11 58 13	-0.7055	.5997	+0.0075	-9.5604	9.692
8	B.A.C. 5954	6	+11	-44	9 41.4	- 6 41 41	-0.1038	.5991	+0.0215	-9.5703	9.677
8	58 Ophiuchi	5	+2	-55	11 31.8	- 4 55 41	-0.2777	.5988	+0.0260	-9.5662	9.683
8	B.A.C. 6088	6	+68	+37	18 44.3	+ 1 50 32	+1.1474	.5975	+0.0438	-9.5878	9.648
8	B.A.C. 6098	6	-32	-90	19 4.2	+ 2 18 39	-0.8987	.5974	+0.0445	-9.5490	9.709
8	μ ¹ Sagittarii	4	+3	-58	23 26.9	+ 6 30 58	-0.3203	.5965	+0.0552	-9.5561	9.699
8	14 Sagittarii	6	+40	-18	23 37.9	+ 6 41 34	+0.3524	.5964	+0.0557	-9.5688	9.679
9	15 Sagittarii	5	-14	-85	0 1.7	+ 7 4 25	-0.6169	.5962	+0.0564	-9.5477	9.708
9	16 Sagittarii	6	-35	-90	0 2.3	+ 7 5 1	-0.9601	.5962	+0.0565	-9.5428	9.718
9	21 Sagittarii	5	-8	-74	4 2.4	+10 55 39	-0.5271	.5958	+0.0658	-9.5466	9.713
9	B.A.C. 6336	6½	+69	+4	9 0.6	- 8 17 53	+0.7372	.5935	+0.0776	-9.5642	9.687
9	B.A.C. 6347	6½	+47	-14	9 25.0	- 7 54 25	+0.4198	.5932	+0.0787	-9.5575	9.697
9	29 Sagittarii	6	+28	-33	13 44.2	- 3 45 21	+0.0879	.5917	+0.0885	-9.5439	9.716
9	ξ ¹ Sagittarii	6	+69	+4	16 48.8	- 0 47 56	+0.7283	.5905	+0.0954	-9.5510	9.706
9	ξ ² Sagittarii	4	+69	+42	16 57.2	- 0 39 49	+1.1981	.5903	+0.0955	-9.5599	9.693
9	B.A.C. 6536	6½	+15	-48	21 15.7	+ 3 28 41	-0.1722	.5886	+0.1046	-9.5935	9.743
10	d Sagittarii	5	+22	-42	1 4.3	+ 7 8 36	-0.0701	.5878	+0.1128	-9.5169	9.751
10	e ¹ Sagittarii	4	-30	-90	2 44.8	+ 8 45 13	-0.9833	.5860	+0.1163	-9.4923	9.780
10	e ² Sagittarii	5½	-2	-73	2 48.0	+ 8 48 17	-0.5147	.5859	+0.1164	-9.5028	9.768
10	B.A.C. 6658	6	+19	-46	5 21.5	+11 16 0	-0.1346	.5847	+0.1214	-9.5045	9.766
10	g Sagittarii	5½	-60	-90	17 49.0	- 0 44 33	-1.2912	0.5817	+0.1445	-9.4634	9.9839

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Apr. 11	B.A.C. 6902	6½	+ 6	-68	h m	h m s	-0.4612	0.5736	+0.1610	-9.4190	9.9845
11	β Capricor.	3	+ 7	-67	3 29.5	+ 8 34 40	-0.4478	.5735	+0.1612	-9.4189	.9845
11	γ Capricor.	6	-36	-90	10 36.7	- 8 33 35	-1.1350	.5698	+0.1716	-9.4302	.9837
11	τ Capricor.	5	+75	+27	11 27.0	- 7 45 4	+1.0904	.5694	+0.1727	-9.4251	.9841
11	B.A.C. 7271	6½	+ 9	-67	16 27.8	- 2 55 1	-0.4518	.5669	+0.1794	-9.3536	.9886
11	B.A.C. 7242	6	-45	-90	17 32.0	- 1 53 2	-1.2331	.5661	+0.1808	-9.3210	.9903
11	8 Aquarii	6	+77	+ 8	20 30.6	+ 0 59 16	+0.8256	.5647	+0.1845	-9.3706	.9877
12	γ Aquarii	4½	+31	-42	0 48.6	+ 5 8 14	-0.0573	.5627	+0.1896	-9.3151	.9905
12	17 Aquarii	6	-20	-90	6 43.3	+10 55 27	-0.9645	.5600	+0.1959	-9.2353	.9935
12	19 Aquarii	6	+17	-58	7 48.9	+11 53 59	-0.3295	.5596	+0.1970	-9.2536	.9929
12	ξ Aquarii	4½	-29	-90	13 29.5	- 6 37 10	-1.1013	.5572	+0.2021	-9.1679	.9952
12	c Capricor	6	+81	+ 8	16 46.4	- 3 26 55	+0.8385	.5562	+0.2048	-9.2269	.9937
12	c Capricor	6½	+80	+32	17 20.8	- 2 53 42	+1.1566	.5558	+0.2053	-9.2355	.9935
13	30 Aquarii	5½	+36	-38	1 10.3	+ 4 39 57	-0.0035	.5528	+0.2107	-9.0970	.9966
13	44 Aquarii	6	+50	-26	7 35.0	+10 51 51	+0.2180	.5508	+0.2143	-9.0241	.9976
13	51 Aquarii	6	+59	-19	10 50.6	- 9 59 6	+0.3638	.5498	+0.2157	-8.9838	.9980
13	π Aquarii	5	+85	+29	17 13.9	- 3 48 24	+1.1384	.5480	+0.2180	-8.9344	.9984
14	3 Piscium	6	-20	-90	4 1.7	+ 6 38 13	-1.0139	.5459	+0.2200	-7.9803	0.0000
14	π Piscium	4½	+82	- 4	16 30.4	- 5 17 17	+0.6401	.5443	+0.2196	+7.9472	0.0000
14	9 Piscium	6	+90	+ 7	16 39.5	- 5 8 31	+0.8149	.5442	+0.2196	+7.8112	0.0000
14	16 Piscium	6	+90	+ 4	21 1.6	- 0 54 54	+0.7633	.5440	+0.2187	+8.3704	9.9999
15	19 Piscium	6	+60	-18	1 47.7	+ 3 41 59	+0.3658	.5436	+0.2173	+8.6777	.9995
19	δ Arietis	4½	+27	-36	2 3.9	+ 0 49 36	-0.1903	.5540	+0.1990	+9.5172	.9751
19	B.A.C. 1032	6½	+3	-63	6 17.4	+ 4 54 36	-0.6144	.5542	+0.1017	+9.5343	.9729
19	τ Arietis	6	- 7	-70	7 9.4	+ 5 44 55	-0.7847	.5544	+0.1001	+9.5332	.9723
19	65 Arietis	6	- 7	-70	7 55.2	+ 6 29 11	-0.7789	.5546	+0.0989	+9.5405	.9721
20	Venus	4½	+13	-47	1 46.7	- 0 15 22	-0.4388	.5028	+0.538	+9.5612	.9691
20	A¹ Tauri	4½	- 8	-69	2 17.0	+ 0 13 53	-0.7918	.5549	+0.643	+9.5680	.9681
20	A² Tauri	6	- 2	-67	2 34.4	+ 0 30 42	-0.7000	.5551	+0.638	+9.5667	.9683
20	ω¹ Tauri	5½	+90	+50	8 4.1	+ 5 49 21	+1.1466	.5549	+0.0531	+9.5390	.9723
20	53 Tauri	6½	+79	+11	9 2.5	+ 6 45 47	+0.5753	.5549	+0.0514	+9.5506	.9707
20	56 Tauri	6½	+32	-26	9 6.5	+ 6 49 38	-0.1113	.5549	+0.0512	+9.5629	.9689
20	π¹ Tauri	5½	+ 6	-55	11 43.1	+ 9 20 55	-0.5707	.5546	+0.0459	+9.5731	.9672
20	π² Tauri	6½	+11	-47	11 44.7	+ 9 22 27	-0.4677	.5546	+0.0459	+9.5714	.9675
20	ν¹ Tauri	5	-35	-68	12 8.1	+ 9 45 5	-1.1223	.5549	+0.0453	+9.5828	.9656
20	τ Tauri	4½	-28	-68	19 25.8	- 7 11 54	-1.0561	.5539	+0.0308	+9.5863	.9650
21	ι Tauri	5	+79	+15	5 1.7	+ 2 4 44	+0.5742	.5530	+0.0121	+9.5619	.9690
21	105 Tauri	6	+68	+ 8	7 15.1	+ 4 13 41	+0.4534	.5525	+0.0078	+9.5645	.9686
21	URANUS	6	-41	-67	11 8.1	+ 7 58 54	-1.1725	.5497	-0.0001	+9.5921	.9640
21	π Tauri	6	+38	-16	12 28.6	+ 9 16 40	-0.0066	.5514	-0.0025	+9.5726	.9673
21	ο Tauri	6	+45	- 9	16 20.8	-10 58 50	+0.1177	.5508	-0.0099	+9.5701	.9677
21	ζ Tauri	3½	+90	+33	21 0.8	- 6 28 9	+0.8888	.5497	-0.0190	+9.5554	.9700
22	B.A.C. 1835	6½	+90	+42	2 1.0	- 1 37 54	+1.0330	.5485	-0.0285	+9.5507	.9707
22	141 Tauri	6	-18	-68	8 12.4	+ 4 21 23	-0.9200	.5470	-0.0400	+9.5809	.9659
22	B.A.C. 1970	6½	-14	-68	11 54.0	+ 7 55 42	-0.8778	.5459	-0.0470	+9.5775	.9665
22	15 Geminor.	6	+46	-14	20 34.3	- 7 40 56	+0.1253	.5434	-0.0628	+9.5518	.9705
22	16 Geminor.	6	+68	+ 3	20 39.6	- 7 35 47	+0.4474	.5434	-0.0630	+9.5458	.9714
22	γ Geminor.	4	+90	+18	21 9.1	- 7 7 16	+0.7246	.5434	-0.0637	+9.5401	.9722
23	ζ Geminor.	4	-33	-69	14 10.8	+ 9 22 7	-1.1194	.5384	-0.027	+9.5497	.9708
23	B.A.C. 2432	6½	+65	- 3	23 19.7	- 5 46 39	+0.4223	.5349	-0.1073	+9.5022	.9769
24	f Geminor.	6	+45	-21	7 24.5	+ 2 3 4	+0.1130	.5317	-0.1212	+9.4896	.9782
24	g Geminor.	5½	-45	-71	10 41.4	+ 5 13 52	-1.2365	.5315	-0.1243	+9.5092	.9761
24	1 Cancri	6	+90	+31	16 10.0	+10 32 20	+1.0328	.5304	-0.1319	+9.4444	.9825
24	3 Cancri	6	-14	-73	18 1.5	-11 39 36	-0.9018	.5299	-0.1346	+9.4825	.9790
24	5 Cancri	6	+37	-30	18 24.2	-11 17 35	-0.0140	.5292	-0.1352	+9.4618	.9810

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ .	At Washington Mean Time of Conjunction.						
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D	
Apr. 25	29 Cancr	6	+63	-9	^{h m s} 8 7.5	+ 2 0 44	+0.4055	0.5264	-1527	+9.4033	9.9856	
25	B.A.C. 2872	6½	+90	+28	10 45.1	+ 4 33 34	+1.0318	.5252	-1559	+9.3752	.9874	
25	A ¹ Cancr	6	+90	+16	15 34.7	+ 9 14 24	+0.8752	.5241	-1613	+9.3575	.9884	
25	A ² Cancr	6	+90	+40	17 29.9	+11 6 13	+1.1779	.5237	-1636	+9.3390	.9894	
25	60 Cancr	6	+90	+19	22 6.4	- 8 25 36	+0.9210	.5235	-1685	+9.3230	.9902	
25	α Cancr	4	+66	-10	23 24.7	- 7 9 38	+0.4380	.5228	-1690	+9.3312	.9898	
26	\times Cancr	5	+90	+16	4 11.8	- 2 31 4	+0.8943	.5225	-1747	+9.2889	.9916	
26	B.A.C. 3122	6½	+23	-49	5 13.4	- 1 31 20	-0.2741	.5223	-1756	+9.3919	.9902	
26	ω Leonis	6	+88	+2	14 53.8	+ 7 51 56	+0.6831	.5211	-1845	+9.2241	.9938	
26	λ Leonis	6	+18	-57	16 41.9	+ 9 36 49	-0.3781	.5210	-1861	+9.2529	.9929	
27	14 Sextantis	6	+72	-9	10 46.2	+ 3 9 3	+0.5226	.5213	-1994	+9.0385	.9974	
27	16 Sextantis	6	+20	-57	12 1.8	+ 4 22 26	-0.3383	.5213	-2000	+9.0757	.9969	
28	34 Sextantis	6	-27	-86	5 14.1	- 2 55 56	-1.1112	.5240	-2066	+8.8741	.9988	
28	36 Sextantis	6	+26	-50	6 32.1	- 1 40 13	-0.2141	.5241	-2091	+8.7472	.9993	
28	B.A.C. 3726	6	+77	-6	10 9.2	+ 1 50 19	+0.5853	.5249	-2103	+8.4844	.9996	
28	55 Leonis	6	+71	-10	11 55.2	+ 3 33 7	+0.5192	.5255	-2108	+8.4067	9.9999	
28	p^2 Leonis	6	+66	-14	15 56.9	+ 7 27 35	+0.4474	.5265	-2118	+8.1056	0.0000	
28	p^3 Leonis	5	+7	-76	21 4.6	-11 34 3	-0.5768	.5283	-2128	+8.0680	0.0000	
29	ϵ Leonis	5	+81	+3	5 22.3	- 3 31 36	+0.7573	.5314	-2135	-8.5947	9.9997	
29	B.A.C. 4006	6	+86	+20	15 36.6	+ 6 23 40	+1.0216	.5358	-2127	-8.9020	.9986	
30	q Virginis	6	+82	+20	12 7.2	+ 2 15 3	+1.0184	.5475	-2056	-9.1797	.9950	
30	γ Virginis	5	-22	-90	14 41.4	+ 4 44 7	-1.0188	.5488	-2041	-9.1008	.9965	
30	B.A.C. 4259	6	-20	-90	14 45.0	+ 4 47 38	-0.9919	.5489	-2040	-9.1030	.9965	
30	B.A.C. 4312	6½	+52	-23	20 18.1	+10 9 45	+0.2849	.5523	-2004	-9.2230	.9939	
30	ψ Virginis	5	-10	-90	21 40.7	+11 29 33	-0.8160	.5534	-1993	-9.1846	.9949	
May 1	g Virginis	6	-8	-90	3 50.9	- 6 32 43	-0.7757	.5574	-1943	-9.2402	.9934	
1	i Virginis	5	+15	-58	12 16.7	+ 1 35 43	-0.3364	.5635	-1861	-9.3179	.9904	
1	B.A.C. 4531	6	+9	-66	15 47.0	+ 4 58 39	-0.4509	.5658	-1820	-9.3358	.9896	
2	B.A.C. 4679	6½	-16	-90	4 38.1	- 6 37 49	-0.8468	.5753	-1653	-9.3931	.9863	
2	B.A.C. 4700	5½	+35	-34	7 19.3	- 4 2 29	+0.0795	.5772	-1613	-9.4312	.9836	
3	B.A.C. 4896	6	-18	-90	0 9.8	-11 49 45	-0.8172	.5890	-1324	-9.4714	.9801	
3	λ^1 Libræ	4½	+38	-25	8 26.0	- 3 52 44	+0.2225	.5943	-1158	-9.5187	.9750	
3	λ^2 Libræ	6½	+27	-37	8 52.7	- 3 27 4	+0.0249	.5944	-1150	-9.5155	.9754	
3	B.A.C. 5109	6½	-14	-90	16 29.8	+ 3 52 9	-0.7124	.5990	-0983	-9.5171	.9751	
3	\times Libræ	5	-37	-90	20 9.3	+ 7 22 54	-1.0257	.6006	-0902	-9.5178	.9751	
4	λ Libræ	6	-27	-90	0 34.4	+11 37 21	-0.8766	.6028	-0797	-9.5290	.9737	
4	B.A.C. 5281	6	+11	-49	2 21.7	-10 39 39	-0.1880	.6034	-0756	-9.5461	.9714	
4	ω^1 Scorpii	4½	-18	-90	5 46.1	- 7 23 30	-0.7181	.6046	-0673	-9.5402	.9722	
4	ω^2 Scorpii	4½	-8	-75	5 59.4	- 7 10 41	-0.5327	.6048	-0668	-9.5442	.9716	
4	B.A.C. 5395	6	+13	-46	8 24.0	- 4 52 0	-0.1320	.6058	-0607	-9.5553	.9700	
4	ω Ophiuchi	5	-2	-62	15 27.0	+ 1 53 47	-0.3783	.6076	-0431	-9.5576	.9697	
5	24 Ophiuchi	6½	+67	+31	0 47.5	+10 51 20	+1.0864	.6091	-0188	-9.5906	.9642	
5	B.A.C. 5758	6	-12	-74	4 23.5	- 9 41 36	-0.5210	.6094	-0094	-9.5616	.9691	
5	ξ Ophiuchi	5	-38	-90	10 0.0	- 4 18 56	-0.9415	.6094	+0052	-9.5536	.9702	
5	B.A.C. 5866	6	-16	-81	11 24.4	- 2 58 0	-0.5848	.6093	+0089	-9.5604	.9692	
5	B.A.C. 5954	6	+18	-37	16 43.9	+ 2 8 20	+0.0140	.6086	+0227	-9.5703	.9677	
5	58 Ophiuchi	5	+9	-47	18 31.3	+ 3 51 19	-0.1561	.6083	+0273	-9.5662	.9683	
6	B.A.C. 6098	6	-23	-90	1 51.3	+10 53 19	-0.7626	.6067	+0469	-9.5490	.9719	
6	μ^1 Sagittarii	4	+10	-49	6 7.1	- 9 1 17	-0.1888	.6053	+0566	-9.5561	.9699	
6	14 Sagittarii	6	+47	-11	6 17.9	- 8 50 57	+0.4766	.6053	+0571	-9.5688	.9679	
6	15 Sagittarii	5	-6	-70	6 41.1	- 8 28 39	-0.4810	.6051	+0583	-9.5497	.9708	
6	16 Sagittarii	6	-25	-90	6 41.7	- 8 28 6	-0.8200	.6051	+0584	-9.5494	.9718	
6	21 Sagittarii	5	0	-63	10 35.6	- 4 43 40	-0.3896	.6038	+0679	-9.5466	.9713	
6	B.A.C. 6336	6½	+69	+13	15 26.3	- 0 4 41	+0.8634	.6016	+0794	-9.5642	.9687	
6	B.A.C. 6347	6½	+56	-7	15 50.1	+ 0 18 8	+0.5494	0.6016	+0804	-9.5575	9.9697	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	I	p'	q'	Log sin D	Log cos D
May	6 29 Sagittarii	6	+36	-25	h m	h m s	+0.2242	0.5905	+0.0899	-9.5439	9.9716
	6 ξ ¹ Sagittarii	6	+59	+12	23 3.2	+ 4 21 7	+0.2592	.5979	+0.0967	-9.5510	.9706
	7 B A C. 6536	6½	+23	-40	3 24.6	+11 25 6	-0.0287	.5955	+0.1067	-9.5235	.9743
	7 d Sagittarii	5	+29	-34	7 8.6	- 8 59 45	+0.0740	.5936	+0.1144	-9.5169	.9751
	7 e ¹ Sagittarii	4	-20	-90	8 47.0	- 7 25 11	-0.8297	.5924	+0.1179	-9.4923	.9780
	7 e ² Sagittarii	5½	+ 6	-61	8 50.1	- 7 22 12	-0.3655	.5924	+0.1180	-9.5028	.9768
	7 B.A.C. 6658	6	+27	-37	11 20.7	- 4 57 26	+0.0118	.5912	+0.1229	-9.5045	.9766
	8 B.A.C. 6902	6½	+14	-57	9 8.0	- 7 59 31	-0.3074	.5772	+0.1618	-9.4190	.9845
	8 β Capricor.	3	+15	-56	9 13.9	- 7 53 46	-0.2937	.5770	+0.1619	-9.4188	.9845
	8 r ¹ Capricor.	6	+75	+49	16 10.5	- 1 12 23	+1.2803	.5725	+0.1722	-9.4301	.9837
	8 r ² Capricor.	5	+75	+43	17 0.5	- 0 24 14	+1.2365	.5720	+0.1733	-9.4250	.9841
	8 B.A.C. 7221	6½	+17	-56	21 58.8	+ 4 23 23	-0.2986	.5687	+0.1799	-9.3536	.9886
	8 B.A.C. 7242	6	-30	-90	23 2.6	+ 5 24 51	-1.0802	.5682	+0.1811	-9.3209	.9903
	9 8 Aquarii	6	+77	+18	2 0.0	+ 8 16 0	+0.9734	.5664	+0.1847	-9.3706	.9877
	9 ♃ Aquarii	4½	+39	-33	6 16.9	-11 36 12	+0.0935	.5638	+0.1895	-9.3150	.9905
	9 17 Aquarii	6	-10	-90	12 15.5	- 5 50 5	-0.8134	.5604	+0.1956	-9.2353	.9935
	9 19 Aquarii	6	+25	-48	13 16.1	- 4 51 35	-0.1798	.5598	+0.1965	-9.2536	.9920
	9 ξ Aquarii	4½	-18	-90	18 56.4	+ 0 37 2	-0.9530	.5567	+0.2013	-9.1678	.9952
	9 c ¹ Capricor.	6	+81	+18	22 13.6	+ 3 47 32	+0.9838	.5551	+0.2038	-9.2969	.9937
	10 30 Aquarii	5½	+44	-30	6 39.0	+11 55 58	+0.1388	.5551	+0.2094	-9.0969	.9966
	10 44 Aquarii	6	+58	-19	13 5.6	- 5 50 13	+0.3566	.5483	+0.2126	-9.0240	.9976
	10 51 Aquarii	6	+69	-11	16 22.5	- 2 39 49	+0.5007	.5469	+0.2139	-8.9837	.9980
	10 ♋ Aquarii	5	+85	+43	22 49.0	+ 3 34 7	+1.2735	.5449	+0.2159	-8.9343	.99984
	11 3 Piscium	6	-12	-90	9 43.6	- 9 52 30	-0.8950	.5419	+0.2175	-7.9794	0.0000
	11 ♋ Piscium	4½	+90	+ 3	22 22.0	+ 2 21 41	+0.7553	.5395	+0.2166	-7.9482	.0000
	11 9 Piscium	6	+90	+14	22 31.2	+ 2 30 34	+0.9305	.5394	+0.2166	+7.8125	0.0000
	12 16 Piscium	6	+11	+90	2 57.0	+ 6 47 59	+0.8780	.5391	+0.2158	+8.3698	9.9999
	12 19 Piscium	6	-12	+67	7 47.4	+11 29 11	+0.4707	.5385	+0.2143	+8.6780	.9995
	13 d Piscium	5½	-83	-17	0 22.1	+ 3 32 24	-0.9532	.5342	+0.2063	+9.1117	.9663
	13 45 Piscium	6	-33	+41	2 50.1	+ 5 55 43	+0.0584	.5388	+0.2047	+9.0819	.9668
	14 101 Piscium	6	-76	-18	12 31.0	- 9 27 41	-0.9694	.5433	+0.1741	+9.3826	.9870
	14 104 Piscium	6½	-49	+22	14 10.4	- 7 51 26	-0.2883	.5438	+0.1720	+9.3711	.9877
	18 ♉ Tauri	5	+12	+74	12 31.8	+11 22 30	+0.5235	.5540	+0.0113	+9.5619	.9690
	18 105 Tauri	6	+ 6	+64	14 45.2	-10 28 35	+0.4011	.5537	+0.0067	+9.5645	.9686
	18 ♋ Tauri	6	+19	+34	19 58.4	- 5 25 49	-0.0634	.5531	-0.0032	+9.5726	.9673
	18 o Tauri	6	-13	+41	23 50.5	- 1 41 31	+0.0587	.5523	-0.0108	+9.5701	.9677
	19 ζ Tauri	3½	+21	+90	4 31.1	+ 2 48 52	+0.8277	.5514	-0.0199	+9.5554	.9700
	19 B.A.C. 1835	6½	+38	+00	9 29.9	+ 7 38 44	+0.9692	.5506	-0.0294	+9.5507	.9707
	19 141 Tauri	6	-68	-23	15 40.8	-10 22 32	-0.9899	.5488	-0.0411	+9.5809	.9659
	19 B.A.C. 1970	6½	-19	-68	19 22.0	- 6 48 35	-0.9499	.5477	-0.0479	+9.5775	.9665
	20 15 Geminor.	6	+41	-18	4 1.7	+ 1 34 8	+0.0503	.5450	-0.0633	+9.5518	.9705
	20 16 Geminor.	6	+62	- 1	4 7.0	+ 1 39 17	+0.3724	.5450	-0.0637	+9.5458	.9714
	20 ♊ Geminor.	4	+88	+14	4 36.4	+ 2 7 43	+0.6506	.5449	-0.0646	+9.5401	.9722
	21 ζ Geminor.	4	-43	-69	21 27.5	- 5 33 33	-1.2048	.5393	-0.0931	+9.5497	.9708
	21 B.A.C. 2432	6½	+59	- 8	6 45.8	+ 3 27 6	+0.3378	.5358	-0.1080	+9.5022	.9769
	21 ♊ Geminor.	6	+39	-26	14 52.6	+11 18 50	+0.0251	.5328	-0.1199	+9.4896	.9782
	21 1 Cancri	6	+90	+25	23 39.6	- 4 10 23	+0.9462	.5298	-0.1322	+9.4444	.9825
	22 3 Cancri	6	-21	-73	1 31.5	- 2 21 53	-0.9954	.5292	-0.1347	+9.4805	.9790
	22 5 Cancri	6	+32	-35	1 54.3	- 1 59 47	-0.1043	.5289	-0.1352	+9.4618	.9810
	22 29 Cancri	6	+57	-14	15 42.2	+11 23 4	+0.3156	.5246	-0.1524	+9.4032	.9856
	22 B.A.C. 2872	6½	+90	+22	18 20.9	-10 3 0	+0.9447	.5245	-0.1554	+9.3752	.9874
	22 A ¹ Cancri	6	+90	+11	23 12.8	- 5 19 46	+0.7872	.5224	-0.1608	+9.3575	.9884
	23 A ² Cancri	6	+90	+32	1 9.0	- 3 26 57	+1.0919	.5220	-0.1628	+9.3390	.9894
	23 60 Cancri	6	+90	+13	5 48.2	+ 1 3 56	+0.8331	.5208	-0.1678	+9.3230	.9902
	23 α Cancri	4	+59	-15	7 7.2	+ 2 20 39	+0.3478	0.5205	-0.1690	+9.3313	9.9898

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.							
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D		
					<div>h m s</div>	<div>h m s</div>							
May 23	α Cancri	5	+90	+11	11 57.4	+ 7 2 18	+0.8072	0.5195	-.1737	+9.2890	9.9916		
23	B.A.C. 3122	6½	+18	-55	12 59.6	+ 8 2 41	-0.3678	.5194	-.1747	+9.3219	.9902		
23	ω Leonis	6	+79	-3	22 47.3	- 6 26 49	+0.5965	.5177	-.1833	+9.2241	.9938		
24	λ Leonis	6	+12	-64	0 36.9	- 4 40 26	-0.4719	.5174	-.1846	+9.2529	.9929		
24	14 Sextantis	6	+65	-13	18 58.2	-10 51 10	+0.4387	.5164	-.1973	+9.0386	.9974		
24	16 Sextantis	6	+15	-63	20 15.1	- 9 36 30	-0.4287	.5164	-.1980	+9.0757	.9969		
25	34 Sextantis	6	-35	-86	13 46.7	+ 7 24 29	-1.2017	.5181	-.2059	+8.8742	.9988		
25	36 Sextantis	6	+22	-55	15 6.2	+ 8 41 44	-0.2966	.5183	-.2064	+8.7473	.9993		
25	B.A.C. 3726	6	+70	-10	18 47.5	-11 43 27	+0.5115	.5192	-.2076	+8.6808	.9998		
25	55 Leonis	6	+65	-14	20 35.7	- 9 58 30	+0.4455	.5195	-.2081	+8.6330	9.9999		
26	p ^h Leonis	6	+60	-18	0 42.4	- 5 59 1	+0.3747	.5205	-.2091	+8.1060	0.0000		
26	p ^h Leonis	5	+3	-84	5 56.4	- 0 54 20	-0.6554	.5219	-.2098	+8.0682	0.0000		
26	e Leonis	5	+88	0	14 24.4	+ 7 18 32	+0.6342	.5249	-.2104	-8.5947	9.9997		
27	B.A.C. 4006	6	+86	+16	0 51.5	- 6 33 27	+0.9663	.5294	-.2097	-8.9020	.9986		
27	q Virginis	6	+86	+17	21 46.0	-10 18 8	+0.9734	.5412	-.2028	-9.1797	.9950		
28	χ Virginis	5	-27	-90	0 22.9	- 7 46 21	-1.0760	.5429	-.2013	-9.1008	.9965		
28	B.A.C. 4259	6	-25	-90	0 26.6	- 7 42 46	-1.0488	.5429	-.2013	-9.1030	.9965		
28	B.A.C. 4332	6½	+49	-25	6 5.3	- 2 14 59	+0.2399	.5468	-.1978	-9.2220	.9939		
28	ψ Virginis	5	-13	-90	7 29.2	- 0 53 53	-0.8672	.5479	-.1967	-9.1845	.9949		
28	g Virginis	6	-11	-90	13 45.0	+ 5 9 30	-0.8216	.5522	-.1920	-9.2402	.9934		
28	i Virginis	5	+13	-61	22 17.6	-10 35 18	-0.3745	.5589	-.1840	-9.3179	.9904		
29	B.A.C. 4531	6	+7	-69	1 50.2	- 7 10 1	-0.4865	.5620	-.1802	-9.3358	.9886		
29	85 Virginis	6	+75	+53	6 37.3	- 2 33 0	+1.2084	.5665	-.1749	-9.4153	.9848		
29	B.A.C. 4679	6½	-18	-90	14 48.1	+ 5 20 21	-0.8750	.5727	-.1639	-9.3931	.9863		
29	B.A.C. 4700	5½	+33	-35	17 30.3	+ 7 56 43	+0.0546	.5749	-.1600	-9.4312	.9836		
30	B.A.C. 4896	6	-19	-90	10 23.2	+ 0 11 48	-0.8310	.5888	-.1316	-9.4714	.9801		
30	λ ¹ Libræ	4½	+37	-26	18 38.1	+ 8 7 33	+0.2111	.5951	-.1154	-9.5187	.9750		
30	λ ¹ Libræ	6½	+26	-37	19 4.5	+ 8 32 52	+0.0149	.5954	-.1147	-9.5155	.9754		
31	B.A.C. 5109	6½	-15	-90	2 39.1	- 8 10 29	-0.7158	.6009	-.0982	-9.5171	.9751		
31	α Libræ	5	-37	-90	6 16.7	- 4 41 35	-1.0252	.6031	-.0901	-9.5178	.9751		
31	λ Libræ	6	-27	-90	10 39.1	- 0 29 50	-0.8740	.6058	-.0797	-9.5290	.9737		
31	B.A.C. 5281	6	+11	-49	12 25.1	+ 1 11 54	-0.1888	.6069	-.0754	-9.5461	.9714		
31	ω ¹ Scorpæ	4½	-18	-90	15 47.0	+ 4 25 33	-0.7138	.6088	-.0671	-9.5402	.9722		
31	ω ^h Scorpæ	4½	-8	-75	16 0.2	+ 4 38 12	-0.5293	.6088	-.0668	-9.5443	.9716		
31	B.A.C. 5395	6	+14	-46	18 22.8	+ 6 54 54	-0.1309	.6100	-.0606	-9.5554	.9700		
June 1	α Ophiuchi	5	-1	-62	1 19.3	-10 25 49	-0.3711	.6131	-.0432	-9.5576	.9697		
1	24 Ophiuchi	6½	+67	+31	10 29.4	- 1 38 45	+1.0834	.6159	-.0187	-9.5906	.9642		
1	B.A.C. 5758	6	-11	-73	14 0.9	+ 1 43 50	-0.5064	.6163	-.0095	-9.5616	.9691		
1	ε Ophiuchi	5	-36	-90	19 29.9	+ 6 58 57	-0.9198	.6170	+0.0056	-9.5536	.9762		
1	B.A.C. 5856	6	-15	-79	20 50.1	+ 8 15 48	-0.5665	.6170	+0.0092	-9.5604	.9682		
2	B.A.C. 5954	6	+18	-36	2 4.0	-10 43 35	+0.0273	.6170	+0.0232	-9.5703	.9677		
2	58 Ophiuchi	5	+10	-46	3 48.7	- 9 3 19	-0.1405	.6169	+0.0281	-9.5662	.9683		
2	B.A.C. 6081	6½	-55	-90	9 59.1	- 3 8 30	-1.1825	.6159	+0.0447	-9.5408	.9721		
2	B.A.C. 6088	6	+68	+55	10 38.1	- 2 31 7	+1.2563	.6157	+0.0462	-9.5878	.9648		
2	B.A.C. 6098	6	-21	-90	10 56.9	- 2 13 7	-0.7377	.6157	+0.0468	-9.5490	.9709		
2	μ ¹ Sagittarii	4	+11	-48	15 5.6	+ 1 45 8	-0.1692	.6148	+0.0578	-9.5561	.9699		
2	14 Sagittarii	6	+49	-10	15 16.1	+ 1 55 9	+0.4857	.6147	+0.0579	-9.5628	.9679		
2	15 Sagittarii	5	-4	-68	15 38.5	+ 2 16 41	-0.4574	.6146	+0.0594	-9.5497	.9708		
2	16 Sagittarii	6	-24	-90	15 39.1	+ 2 17 13	-0.7923	.6146	+0.0594	-9.5428	.9718		
2	21 Sagittarii	5	+1	-61	19 26.3	+ 5 54 58	-0.3659	.6133	+0.0691	-9.5466	.9713		
3	B.A.C. 6336	6½	+69	+13	0 8.4	+10 25 17	+0.8698	.6118	+0.0808	-9.5642	.9687		
3	29 Sagittarii	6	+37	-24	4 36.8	- 9 17 25	+0.2409	.6095	+0.0920	-9.5439	.9716		
3	ξ Sagittarii	6	+69	+13	7 31.5	- 6 29 52	+0.8670	.6081	+0.0969	-9.5510	.9706		
3	B.A.C. 6536	6½	+24	-38	11 44.4	- 2 27 18	-0.0670	.6059	+1.086	-9.5235	.9743		
3	d Sagittarii	5	+31	-33	15 21.2	+ 1 0 42	+0.0952	0.6038	+1.165	-9.5169	9.9751		

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		<i>H</i>	<i>Y</i>	<i>p'</i>	<i>q'</i>	Log sin <i>D</i>	Log cos <i>D</i>
June 3	ϵ^1 Sagittarii	4	-18	-90	16 56.5	+ 2 32 8	-0.7949	0.6031	+1.199	-9.4923	9.9780
3	ϵ^2 Sagittarii	5½	+ 8	-59	16 59.5	+ 2 34 59	-0.3376	.6030	+1.1262	-9.5028	.9768
3	B.A.C. 6658	6	+28	-36	19 25.3	+ 4 55 0	+0.0345	.6013	+1.1255	-9.5045	.9766
4	γ Sagittarii	5½	-36	-90	7 16.3	- 7 42 9	-1.0924	.5936	+1.1488	-9.4364	.9832
4	B.A.C. 6992	6½	+16	-55	16 30.8	+ 1 10 58	-0.2779	.5868	+1.1648	-9.4190	.9845
4	β Capricor.	3	+16	-54	16 36.6	+ 1 16 32	-0.2643	.5867	+1.1649	-9.4188	.9845
4	ϵ^1 Capricor.	6	+75	+52	23 20.4	+ 7 45 5	+1.2871	.5820	+1.1753	-9.4301	.9837
4	ϵ^2 Capricor.	5	+75	+44	0 8.8	+ 8 31 41	+1.2439	.5816	+1.1761	-9.4250	.9841
5	B.A.C. 7221	6½	+18	-54	4 58.2	-10 49 37	-0.2684	.5780	+1.1827	-9.3536	.9886
5	B.A.C. 7242	6	-27	-90	6 0.1	- 9 50 4	-1.0390	.5772	+1.1844	-9.3208	.9903
5	8 Aquarii	6	+77	+19	8 52.4	- 7 4 2	+0.9858	.5750	+1.1876	-9.3766	.9877
5	ν Aquarii	4½	+41	-32	13 1.9	- 3 3 38	+0.1176	.5723	+1.1923	-9.3150	.9905
5	17 Aquarii	6	- 8	-90	18 50.8	+ 2 32 43	-0.7775	.5681	+1.1982	-9.2352	.9935
5	19 Aquarii	6	+26	-47	19 49.7	+ 3 20 33	-0.1525	.5675	+1.1992	-9.2535	.9929
6	ξ Aquarii	4½	-16	-90	1 21.3	+ 8 49 27	-0.9166	.5642	+1.2039	-9.1678	.9952
6	ϵ^1 Capricor.	6	+81	+19	4 33.7	+11 55 8	+0.9972	.5620	+1.2063	-9.2268	.9937
6	ϵ^2 Capricor.	6½	+89	+51	5 7.3	-11 32 24	+1.3113	.5617	+1.2067	-9.2354	.9935
6	30 Aquarii	5½	+46	-29	12 47.5	- 4 8 6	+0.1678	.5569	+1.2115	-9.0969	.9966
6	44 Aquarii	6	+59	-18	19 6.3	+ 1 57 52	+0.3761	.5535	+1.2145	-9.0239	.9976
6	51 Aquarii	6	+70	-10	22 19.5	+ 5 4 37	+0.5190	.5521	+1.2157	-8.9836	.9980
7	π Aquarii	5	+85	+45	4 39.3	+11 11 46	+1.2844	.5490	+1.2174	-8.9342	9.9984
7	3 Piscium	6	-10	-90	15 24.5	- 2 24 13	-0.8680	.5448	+1.2185	-7.9733	0.0000
8	π Piscium	4½	+90	+ 4	3 55.1	+ 9 42 7	+0.7698	.5410	+1.2171	+7.9493	.0000
8	9 Piscium	6	+90	+15	4 4.3	+ 9 51 0	+0.9453	.5410	+1.2170	+7.8130	0.0000
8	16 Piscium	6	+90	+12	8 28.2	- 9 53 30	+0.8898	.5401	+1.2158	+7.3709	9.9999
8	19 Piscium	6	+68	-12	13 16.9	- 5 14 0	+0.4864	.5393	+1.2143	+8.6780	.9995
9	δ Piscium	5½	-16	-83	5 49.3	+10 46 57	-0.9548	.5374	+1.2048	+9.1118	.9963
9	45 Piscium	6	+42	-33	8 17.4	-10 49 40	+0.0717	.5375	+1.2041	+9.0820	.9968
10	101 Piscium	6	-17	-76	18 8.1	- 2 3 10	-0.9625	.5398	+1.1728	+9.3826	.9870
10	104 Piscium	6½	+23	-49	19 48.4	- 0 26 5	-0.2806	.5401	+1.1708	+9.3711	.9877
11	27 Arietis	6	+24	-43	20 22.8	- 0 39 2	-0.2484	.5449	+1.1375	+9.4684	.9804
12	40 Arietis	6	+48	-23	4 40.8	+ 7 22 49	+0.1752	.5466	+1.1246	+9.4833	.9789
12	π Arietis	5½	+90	+30	5 3.2	+ 7 44 23	+1.1107	.5466	+1.1244	+9.4632	.9808
12	ϵ^1 Arietis	7½	+90	+41	7 41.5	+10 17 34	+1.1256	.5473	+1.1199	+9.4713	.9802
12	ϵ^2 Arietis	6	+74	+ 1	8 5.9	+10 41 14	+0.5265	.5473	+1.1195	+9.4847	.9788
12	ϵ^3 Arietis	6	+90	+23	8 22.6	+10 57 23	+0.8845	.5473	+1.1188	+9.4775	.9795
12	54 Arietis	6½	+89	+10	13 57.5	- 7 38 40	+0.6651	.5481	+1.1098	+9.4962	.9775
12	δ Arietis	4½	+27	-36	15 27.8	- 6 11 20	-0.1929	.5487	+1.1070	+9.5172	.9751
12	B.A.C. 1032	6½	+ 3	-64	19 45.8	- 2 1 53	-0.6243	.5495	+1.0999	+9.5343	.9727
12	ϵ^4 Arietis	6	- 8	-70	20 38.7	- 1 10 40	-0.7969	.5495	+1.0982	+9.5392	.9723
12	65 Arietis	6	- 8	-70	21 25.3	- 0 25 39	-0.7920	.5498	+1.0969	+9.5405	.9721
13	13 Tauri	6½	+90	+43	5 45.1	+ 7 37 37	+1.1064	.5509	+1.0821	+9.5183	.9750
13	A ¹ Tauri	4½	-10	-60	16 2.7	- 6 25 15	-0.8196	.5522	+1.0633	+9.5680	.9681
13	A ² Tauri	6	- 4	-69	16 20.2	- 6 8 17	-0.7276	.5523	+1.0628	+9.5667	.9683
13	ω^3 Tauri	5½	+90	+48	21 53.6	- 0 45 58	+1.1264	.5526	+1.0522	+9.5390	.9723
13	53 Tauri	6½	+77	+10	2 52.6	+ 0 11 58	+0.5509	.5527	+1.0503	+9.5506	.9707
13	56 Tauri	6½	+30	-28	22 56.7	+ 0 14 57	-0.1401	.5527	+1.0502	+9.5629	.9629
14	π^1 Tauri	5½	+ 3	-58	1 34.7	+ 2 47 44	-0.6042	.5530	+1.0450	+9.5731	.9672
14	π^2 Tauri	6½	+ 9	-50	1 36.3	+ 2 49 17	-0.5006	.5530	+1.0448	+9.5714	.9675
14	ν^1 Tauri	5	-39	-68	1 59.9	+ 3 12 8	-1.1596	.5530	+1.0444	+9.5628	.9656
17	ζ Geminor.	4	-39	-69	4 3.2	+ 2 49 41	-1.1822	.5531	-1.0926	+9.5497	.9708
17	B.A.C. 2432	6½	+61	- 6	13 22.2	+11 51 3	+0.3661	.5370	-1.1079	+9.5022	.9769
17	ζ Geminor.	6	+41	-24	21 27.8	- 4 18 25	+0.0557	.5342	-1.1198	+9.4896	.9782
18	1 Cancri	6	+90	+27	6 14.7	+ 4 12 17	+0.9824	.5311	-1.320	+9.4444	.9825
18	3 Cancri	6	-19	-73	8 6.6	+ 6 0 43	-0.9631	0.5303	-1.1345	+9.4825	9.9790

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
June 18	5 Cancri	6	+34	-33	h m	h m s					
18	29 Cancri	6	+60	-12	8 29.4	+ 6 22 49	-0.0699	0.5302	-.1351	+9.4618	9.9810
19	B.A.C. 2872	6½	+90	+25	22 17.9	- 4 13 41	+0.3554	.5255	-.1523	+9.4032	.9856
19	A¹ Cancri	6	+90	+14	0 56.8	- 1 39 32	+0.9884	.5253	-.1552	+9.3751	.9874
19	A² Cancri	6	+90	+36	5 49.2	+ 3 4 12	+0.8320	.5231	-.1607	+9.3575	.9884
19	60 Cancri	6	+90	+16	7 45.8	+ 4 57 22	+1.1389	.5226	-.1627	+9.3390	.9794
19	α Cancri	4	+62	-12	12 25.7	+ 9 28 58	+0.8814	.5211	-.1675	+9.3230	.9902
19	π Cancri	5	+90	+14	13 45.0	+10 45 59	+0.3949	.5208	-.1688	+9.3313	.9898
19	B.A.C. 3122	6½	+20	-52	18 36.4	- 8 31 14	+0.8578	.5194	-.1735	+9.2890	.9916
20	α Leonis	6	+84	0	19 38.9	- 7 30 33	-0.3223	.5190	-.1742	+9.3221	.9962
20	λ Leonis	6	+15	-60	5 29.8	+ 2 3 11	+0.6503	.5170	-.1827	+9.2241	.9938
21	14 Sextantis	6	+70	-10	7 20.1	+ 3 50 20	-0.4232	.5167	-.1840	+9.2529	.9929
21	16 Sextantis	6	+18	-59	1 51.3	- 2 10 27	+0.4995	.5143	-.1961	+9.0386	.9974
21	34 Sextantis	6	-30	-86	3 9.0	- 0 54 56	-0.3736	.5143	-.1968	+9.0757	.9969
21	36 Sextantis	6	+25	-51	20 55.1	- 7 39 28	-1.1500	.5144	-.2042	+8.8742	.9988
22	B.A.C. 3726	6	+76	- 7	22 15.9	- 6 20 56	-0.2361	.5145	-.2046	+8.7474	.9993
22	55 Leonis	6	+71	-10	2 1.0	- 2 42 21	+0.5799	.5146	-.2056	+8.4846	.9998
22	p¹ Leonis	6	+65	-14	3 51.1	- 0 55 26	+0.5136	.5152	-.2061	+8.4670	9.9999
22	p² Leonis	5	+ 6	-78	8 2.3	+ 3 8 30	+0.4434	.5158	-.2069	+8.1062	0.0000
22	e Leonis	5	+78	+ 4	13 22.3	+ 8 19 16	-0.5961	.5166	-.2075	+8.0685	0.0000
22	α Leonis	5	+78	+ 4	22 1.1	+ 7 17 6	+0.7684	.5190	-.2079	+8.5946	9.9997
23	B.A.C. 4006	6	+86	+20	8 42.7	+ 3 5 35	+1.0447	.5229	-.2070	-8.0020	.9986
24	γ Virginis	6	+82	+23	6 9.9	- 0 6 27	+1.0517	.5333	-.1998	-9.17 6	.9950
24	χ Virginis	5	-22	-90	8 51.0	+ 2 29 36	-1.0228	.5343	-.1984	-9.1008	.9965
24	B.A.C. 4259	6	-21	-90	8 54.8	+ 2 33 22	-0.9961	.5344	-.1984	-9.1030	.9965
24	B.A.C. 4312	6½	+53	-21	14 43.0	+ 8 10 33	+0.3075	.5386	-.1949	-9.2220	.9939
24	ψ Virginis	5	- 9	-90	16 9.2	+ 9 33 58	-0.8124	.5395	-.1940	-9.1845	.9949
24	φ Virginis	6	- 7	-90	22 35.7	- 8 11 58	-0.7686	.5440	-.1892	-9.2402	.9934
25	ι Virginis	5	+16	-57	7 22.7	+ 0 17 43	-0.3175	.5506	-.1813	-9.3179	.9904
25	B.A.C. 4331	6	+10	-65	11 1.3	+ 3 49 1	-0.4323	.5332	-.1778	-9.3358	.9896
26	B.A.C. 4679	6½	-15	-90	0 20.4	- 7 19 21	-0.8291	.5623	-.1620	-9.3032	.9863
26	B.A.C. 4700	5½	+36	-32	3 6.9	- 4 38 40	+0.1095	.5662	-.1581	-9.4312	.9836
26	B.A.C. 4896	6	-16	-90	20 24.4	-11 58 52	-0.7927	.5814	-.1305	-9.4714	.9801
27	¹ Libræ	4½	+40	-24	4 49.8	- 3 52 39	+0.2539	.5883	-.1147	-9.5187	.9750
27	² Libræ	6½	+28	-35	5 16.7	- 3 26 45	+0.0560	.5887	-.1139	-9.5155	.9754
27	B.A.C. 5109	6½	-13	-90	12 59.6	+ 3 58 12	-0.6844	.5948	-.0980	-9.5171	.9751
27	π Libræ	5	-34	-90	16 40.8	+ 7 30 40	-0.9979	.5976	-.0896	-9.5178	.9751
27	¹ Libræ	6	-25	-90	21 7.1	+11 46 22	-0.8478	.6008	-.0799	-9.5290	.9737
27	B.A.C. 5281	6	+13	-47	22 54.6	-10 30 26	-0.1603	.6020	-.0757	-9.5461	.9714
28	ω¹ Scorpii	4½	-17	-90	2 19.0	- 7 14 18	-0.6895	.6042	-.0678	-9.5402	.9722
28	ω² Scorpii	4½	- 6	-72	2 32.3	- 7 1 30	-0.5045	.6046	-.0669	-9.5442	.9716
28	B.A.C. 5395	6	+15	-44	4 56.5	- 4 43 10	-0.1064	.6058	-.0613	-9.5553	.9700
28	ω Ophiuchi	5	0	-60	11 56.8	+ 1 59 55	-0.3520	.6098	-.0438	-9.5576	.9697
28	B.A.C. 5758	6	-11	-72	0 42.0	- 9 46 49	-0.4958	.6155	-.0100	-9.5616	.9691
28	ξ Ophiuchi	5	-36	-90	6 11.2	- 4 31 32	-0.9126	.6167	+0.0045	-9.5536	.9702
28	B.A.C. 5866	6	-15	-78	7 33.5	- 3 12 40	-0.5607	.6170	+0.0084	-9.5604	.9692
29	B.A.C. 5954	6	+18	-36	12 44.4	+ 1 45 0	+0.0277	.6182	+0.0225	-9.5703	.9677
29	58 Ophiuchi	5	+10	-46	14 28.5	+ 3 24 44	-0.1406	.6182	+0.0274	-9.5662	.9683
29	B.A.C. 6098	6	-22	-90	21 34.0	+10 12 12	-0.7413	.6183	+0.0466	-9.5490	.9709
30	μ¹ Sagittarii	4	+10	-49	1 40.4	- 9 51 56	-0.1788	.6182	+0.0576	-9.5561	.9699
30	14 Sagittarii	6	+40	-11	1 50.7	- 9 42 0	+0.4728	.6180	+0.0578	-9.5688	.9679
30	15 Sagittarii	5	- 5	-69	2 13.0	- 9 20 43	-0.4658	.6180	+0.0588	-9.5497	.9708
30	16 Sagittarii	6	-20	-90	2 13.6	- 9 20 7	-0.7978	.6180	+0.0589	-9.5428	.9718
30	21 Sagittarii	5	+ 1	-62	5 58.2	- 5 45 3	-0.3781	.6175	+0.0686	-9.5466	.9713
30	29 Sagittarii	6	+34	-25	15 0.8	+ 2 54 41	+0.2168	.6149	+0.0916	-9.5439	.9716
30	ξ¹ Sagittarii	6	+60	+11	17 52.5	+ 5 39 15	+0.8352	0.6138	+0.0989	-9.5510	9.9706

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.		Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.						
				North- ern.	South- ern.		<i>H</i>	<i>Y</i>	<i>p'</i>	<i>q'</i>	Log sin <i>D</i>	Log cos <i>D</i>	
						^h ^m ^s	^h ^m ^s						
July	1	<i>d</i> Sagittarii	5	+29	-34	1 33.3	-10 59 6	+0.0619	0.6107	+1.173	-0.5169	9.9751	
	1	<i>e</i> ¹ Sagittarii	4	-19	-90	3 6.6	-9 29 41	-0.8208	.6100	+1.205	-0.4122	.9780	
	1	<i>e</i> ² Sagittarii	5½	+6	-61	3 9.5	-9 26 52	-0.3678	.6100	+1.206	-0.5027	.9768	
	1	B.A.C. 6658	6	+26	-38	5 32.1	-7 10 8	-0.0019	.6086	+1.261	-0.5044	.9766	
	1	<i>g</i> Sagittarii	5½	-39	-90	17 5.8	+3 55 25	-1.1262	.6021	+1.500	-0.4363	.9832	
	2	B.A.C. 6992	6½	+13	-58	2 5.1	-11 26 42	-0.3206	.5965	+1.664	-0.4189	.9845	
	2	<i>β</i> Capricor.	3	+14	-57	2 10.8	-11 21 18	-0.3163	.5964	+1.666	-0.4188	.9845	
	2	<i>r</i> ¹ Capricor.	6	+75	+39	8 42.6	-5 4 42	+1.2.81	.5918	+1.772	-0.4301	.9837	
	2	<i>r</i> ² Capricor.	5	+75	+34	9 29.5	-4 19 38	+1.1647	.5912	+1.784	-0.4250	.9841	
	2	B.A.C. 7221	6½	+15	-58	14 9.9	+0 9 58	-0.3312	.5880	+1.851	-0.3535	.9886	
	2	B.A.C. 7242	6	-32	-90	15 9.9	+1 7 40	-1.0917	.5874	+1.864	-0.3208	.9903	
	2	8 Aquarii	6	+77	+13	17 56.7	+3 48 9	+0.9018	.5855	+1.900	-0.3705	.9877	
	2	<i>v</i> Aquarii	4½	+36	-36	21 58.1	+7 40 28	+0.0425	.5826	+1.949	-0.3150	.9905	
	3	17 Aquarii	6	-12	-90	3 35.4	-10 54 45	-0.8441	.5785	+2.013	-0.2351	.9935	
	3	19 Aquarii	6	+22	-51	4 32.4	-9 59 50	-0.2289	.5780	+2.021	-0.2535	.9929	
	3	<i>ξ</i> Aquarii	4½	-21	-90	9 52.9	-4 51 7	-0.9861	.5745	+2.070	-0.1677	.9962	
	3	<i>c</i> ¹ Capricor.	6	+81	+13	12 58.8	-1 51 59	+0.8954	.5724	+2.094	-0.2268	.9937	
	3	30 Aquarii	5½	+40	-34	20 55.9	+5 48 5	+0.0663	.5674	+2.148	-0.0068	.9966	
	4	44 Aquarii	6	+53	-23	3 2.0	+11 41 18	+0.2741	.5638	+2.178	-0.0239	.9976	
	4	51 Aquarii	6	+62	-16	6 8.8	-9 18 23	+0.4126	.5621	+2.191	-0.8935	.9980	
	4	<i>x</i> Aquarii	5	+85	+32	12 16.2	-3 23 42	+1.1631	.5589	+2.207	-8.9340	9.9984	
	4	3 Piscium	6	-16	-90	22 40.9	+6 39 50	-0.9634	.5537	+2.217	-7.9772	0.0000	
	5	<i>x</i> Piscium	4½	+83	-3	10 49.5	-5 35 56	+0.6462	.5489	+2.200	+7.9566	.0000	
	5	9 Piscium	6	+90	+7	10 58.4	-5 27 20	+0.8175	.5487	+2.199	+7.8164	0.0000	
	5	16 Piscium	6	+90	+4	15 15.1	-1 19 5	+0.7621	.5477	+2.187	+8.3717	9.9999	
	5	19 Piscium	6	+60	-18	19 56.2	+3 12 51	+0.3631	.5420	+2.172	+8.4806	.9995	
	6	<i>d</i> Piscium	5½	-24	-83	12 5.4	-5 9 29	-1.0641	.5430	+2.078	+9.1119	.9963	
	6	45 Piscium	6	+35	-38	14 30.5	-2 49 2	-0.0486	.5425	+2.061	+9.0821	.9968	
	7	101 Piscium	6	-26	-76	23 51.9	+5 28 0	-1.0710	.5416	+1.735	+9.3826	.9870	
	8	104 Piscium	6½	+16	-56	1 31.3	+7 4 11	-0.3930	.5416	+1.714	+9.3711	.9877	
	9	27 Arietis	6	+18	-49	1 58.2	+6 43 44	-0.3507	.5441	+1.380	+9.4684	.9804	
	9	40 Arietis	6	+42	-23	10 15.7	-9 14 55	+0.0762	.5450	+1.254	+9.4833	.9789	
	9	<i>π</i> Arietis	5½	+90	+31	10 38.2	-8 53 13	+1.0095	.5454	+1.246	+9.4632	.9808	
	9	<i>ρ</i> ¹ Arietis	7½	+90	+33	13 16.5	-6 20 5	+1.0264	.5456	+1.205	+9.4703	.9802	
	9	<i>ρ</i> ² Arietis	6	-65	-4	13 40.9	-5 56 25	+0.4290	.5459	+1.196	+9.4847	.9788	
	9	<i>ρ</i> ³ Arietis	6	+90	+16	13 57.6	-5 40 15	+0.7865	.5459	+1.192	+9.4775	.9795	
	9	54 Arietis	6½	+77	+4	19 33.1	-0 15 47	+0.5718	.5466	+1.110	+9.4962	.9775	
	9	<i>δ</i> Arietis	4½	+22	-42	21 3.5	+1 11 41	-0.2841	.5469	+1.076	+9.5172	.9751	
	10	B.A.C. 1032	6½	-3	-70	1 22.1	+5 21 47	-0.7114	.5474	+1.062	+9.5343	.9729	
	10	<i>τ</i> ² Arietis	6	-14	-70	2 15.2	+6 13 9	-0.8333	.5474	+0.986	+9.5392	.9723	
	10	65 Arietis	6	-13	-70	3 1.9	+6 58 17	-0.8776	.5475	+0.974	+9.5405	.9721	
	10	13 Tauri	6½	+90	+37	11 23.4	-8 56 40	+1.0252	.5487	+0.824	+9.5183	.9750	
	10	<i>A</i> ¹ Tauri	4½	-15	-60	21 43.9	+1 3 19	-0.8917	.5497	+0.637	+9.5680	.9681	
	11	<i>ω</i> ² Tauri	5½	+90	-42	3 36.7	+6 44 28	+1.0600	.5502	+0.527	+9.5390	.9723	
	11	53 Tauri	6½	+71	+6	4 36.0	+7 41 45	+0.4854	.5503	+0.508	+9.5506	.9707	
	11	56 Tauri	6½	+26	-31	4 40.0	+7 45 44	-0.2058	.5503	+0.507	+9.5629	.9689	
	11	<i>α</i> ¹ Tauri	5½	0	-64	7 18.9	+10 19 21	-0.6674	.5504	+0.463	+9.5731	.9672	
	11	<i>α</i> ² Tauri	6½	+6	-55	7 20.5	+10 20 54	-0.5640	.5504	+0.459	+9.5714	.9675	
	11	<i>ν</i> ¹ Tauri	5	-48	-68	7 44.3	+10 43 55	-1.2229	.5504	+0.450	+9.5828	.9656	
	11	<i>τ</i> Tauri	4½	-38	-68	15 8.1	-6 7 2	-1.1540	.5504	+0.311	+9.5863	.9650	
	12	<i>ι</i> Tauri	5	+71	+10	0 50.8	+3 16 24	+0.4899	.5504	+0.124	+9.5619	.9690	
	12	105 Tauri	6	+62	+4	3 5.6	+5 26 44	+0.3696	.5502	+0.082	+9.5645	.9686	
	12	<i>η</i> Tauri	6	+33	-20	8 21.9	+10 32 35	-0.0905	.5501	-0.022	+9.5726	.9673	
	12	<i>ο</i> Tauri	6	+40	-14	12 16.1	-9 40 58	+0.0367	.5498	-0.094	+9.5701	.9677	
	12	<i>ζ</i> Tauri	3½	+90	+28	16 58.0	-5 8 18	+0.8151	0.5492	-0.184	+9.5554	9.9700	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of Conj.	At Washington Mean Time of Conjunction.						
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D	
July 12	B.A.C. 1835	6½	+90	+37	22 0.0	h m s	h m s	+0.9636	0.5485	-.0278	+9.5507	9.9707
13	141 Tauri	6	-23	-68	4 13.3	+ 5 44 52	-0.9938	.5477	-.0393	+9.5809	.9659	
13	B.A.C. 1970	6½	-19	-68	7 55.6	+ 9 19 56	-0.9480	.5469	-.0461	+9.5775	.9665	
13	15 Geminor.	6	+42	-17	16 37.3	- 6 15 18	+0.0681	.5449	-.0620	+9.5518	.9705	
13	16 Geminor.	6	+63	0	16 42.6	- 6 10 10	+0.3916	.5449	-.0622	+9.5458	.9714	
13	♊ Geminor.	4	+90	+15	17 12.0	- 5 41 39	+0.6708	.5449	-.0629	+9.5401	.9722	
16	♋ Cancri	4	+70	- 7	19 40.1	- 5 31 34	+0.4923	.5226	-.0683	+9.3313	.9698	
17	♋ Cancri	5	+90	+21	0 30.6	- 0 49 31	+0.9620	.5214	-.0728	+9.2890	.9916	
17	B.A.C. 3132	6½	+26	-46	1 32.9	+ 0 10 56	-0.2180	.5211	-.0737	+9.3220	.9902	
17	♌ Leonis	6	+90	+ 7	11 22.4	+ 9 43 10	+0.7686	.5187	-.0820	+9.2241	.9938	
17	♌ Leonis	6	+21	-52	13 12.4	+11 30 4	-0.3040	.5186	-.0634	+9.2529	.9929	
18	♌ Leonis	5	-57	-82	4 10.8	+ 2 2 31	-1.3409	.5162	-.1935	+9.1795	.9960	
18	14 Sextantis	6	+83	- 2	7 42.5	+ 5 28 9	+0.6436	.5157	-.1955	+9.0387	.9974	
18	16 Sextantis	6	+25	-50	9 0.3	+ 6 43 44	-0.2312	.5157	-.1961	+9.0758	.9969	
19	34 Sextantis	6	-18	-86	2 48.5	+ 0 1 20	-0.9929	.5146	-.2033	+8.8743	.9968	
19	36 Sextantis	6	+34	-42	4 9.7	+ 1 20 14	-0.0738	.5147	-.2037	+8.7474	.9993	
19	B.A.C. 3726	6	+90	+ 3	7 55.7	+ 4 59 49	+0.7501	.5149	-.2046	+8.4648	.9998	
19	55 Leonis	6	+87	- 1	9 46.3	+ 6 47 15	+0.6853	.5149	-.2051	+8.4071	.9999	
19	p ¹ Leonis	6	+80	- 5	13 59.1	+10 52 44	+0.6184	.5152	-.2058	+8.1064	0.0000	
19	p ² Leonis	5	+15	-64	19 21.7	- 7 53 52	-0.4239	.5161	-.2064	+8.1048	0.0000	
20	♌ Leonis	5	+88	+16	4 5.3	+ 0 34 36	+0.9559	.5174	-.2065	-8.5945	9.9997	
20	B.A.C. 4006	6	+86	+40	14 54.7	+11 5 1	+1.2411	.5199	-.2052	-8.9019	.9986	
21	♑ Virginis	6	+82	+42	12 44.0	+ 8 15 14	+1.2575	.5284	-.1977	-9.1796	.9960	
21	♑ Virginis	5	-10	-90	15 28.5	+10 54 42	-0.8389	.5298	-.1961	-9.1008	.9965	
21	B.A.C. 4259	6	- 9	-90	15 32.5	+10 58 32	-0.8119	.5298	-.1961	-9.1029	.9965	
21	B.A.C. 4312	6½	+67	-10	21 28.4	- 7 16 30	+0.5070	.5330	-.1926	-9.2220	.9939	
21	♒ Virginis	5	+ 2	-81	22 56.6	- 5 51 1	-0.6266	.5336	-.1917	-9.1845	.9949	
22	♒ Virginis	6	+ 3	-77	5 32.5	+ 0 32 27	-0.5830	.5374	-.1868	-9.2412	.9934	
22	50 Virginis	6	-38	-90	6 26.8	+ 1 25 3	-1.1855	.5380	-.1860	-9.2222	.9939	
22	♓ Virginis	5	+27	-45	14 33.6	+ 9 16 16	-0.1287	.5430	-.1790	-9.3179	.9904	
22	B.A.C. 4531	6	+20	-52	18 18.4	-11 6 15	-0.2463	.5455	-.1755	-9.3358	.9886	
23	B.A.C. 4679	6½	- 4	-86	8 1.6	+ 2 9 34	-0.6552	.5550	-.1597	-9.3931	.9863	
23	B.A.C. 4700	5½	+47	-22	10 53.4	+ 4 55 31	+0.2950	.5574	-.1560	-9.4312	.9836	
24	B.A.C. 4896	6	- 7	-85	4 45.1	- 1 50 22	-0.6342	.5712	-.1290	-9.4714	.9801	
24	♎ Libræ	4½	+50	-14	13 27.6	+ 6 33 0	+0.4203	.5778	-.1135	-9.5187	.9750	
24	♎ Libræ	6½	+38	-26	13 55.4	+ 6 59 46	+0.2186	.5782	-.1127	-9.5155	.9754	
24	B.A.C. 5109	6½	- 5	-75	21 53.9	- 9 19 31	-0.5411	.5842	-.0972	-9.5171	.9751	
25	41 Libræ	6	-46	-90	0 28.4	- 6 50 59	-1.1437	.5865	-.0917	-9.5013	.9761	
25	♏ Libræ	5	-25	-90	1 42.5	- 5 39 39	-0.8632	.5875	-.0891	-9.5172	.9751	
25	B.A.C. 5231	6	+21	-39	8 8.6	+ 0 31 30	-0.0210	.5917	-.0755	-9.5461	.9714	
25	♏ Scorpii	4½	- 9	-78	11 39.6	+ 3 54 19	-0.5620	.5940	-.0673	-9.5401	.9722	
25	♏ Scorpii	4½	+ 1	-62	11 53.4	+ 4 7 32	-0.3748	.5943	-.0670	-9.5442	.9716	
25	B.A.C. 5395	6	+22	-36	14 22.2	+ 6 30 28	+0.0258	.5962	-.0611	-9.5553	.9700	
25	♐ Ophiuchi	5	+ 6	-52	21 35.4	-10 33 30	-0.2326	.6003	-.0439	-9.5576	.9697	
26	B.A.C. 5758	6	- 5	-64	10 42.2	+ 2 1 27	-0.3644	.6070	-.0111	-9.5616	.9691	
26	♑ Ophiuchi	5	-31	-90	16 19.7	+ 7 25 4	-0.8262	.6088	+0.0029	-9.5536	.9712	
26	B.A.C. 5866	6	-10	-70	17 44.0	+ 8 45 54	-0.4724	.6094	+0.0068	-9.5604	.9692	
26	B.A.C. 5954	6	+23	-31	23 1.9	-10 9 17	+0.1132	.6108	+0.0204	-9.5703	.9677	
27	58 Ophiuchi	5	+14	-41	0 48.7	- 8 27 16	-0.0599	.6114	+0.0254	-9.5662	.9683	
27	B.A.C. 6098	6	-18	-90	8 2.3	- 1 31 24	-0.6769	.6123	+0.0440	-9.5490	.9709	
27	♐ Sagittarii	4	+13	-45	12 12.9	+ 2 28 44	-0.1174	.6126	+0.0549	-9.5561	.9699	
27	14 Sagittarii	6	+53	- 7	12 23.4	+ 2 38 48	+0.5387	.6128	+0.0557	-9.5688	.9679	
27	15 Sagittarii	5	- 2	-64	12 46.0	+ 3 0 28	-0.4076	.6126	+0.0565	-9.5497	.9708	
27	16 Sagittarii	6	-21	-90	12 46.6	+ 3 1 4	-0.7430	.6126	+0.0567	-9.5498	.9718	
27	21 Sagittarii	5	+ 3	-58	16 34.6	+ 6 39 34	-0.3256	.6124	+0.0665	-9.5466	.9713	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.						
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D	
July 27	B.A.C. 6336	6½	+69	+15	21 16.6	+11	9 52	+0.8962	0.6124	+0.782	-9.5642	9.9687
27	B.A.C. 6347	6½	+59	-5	21 39.7	+11	31 58	+0.5862	.6123	+0.794	-9.5575	.9697
28	29 Sagittarii	6	+37	-23	1 43.8	-8	34 2	+0.2555	.6119	+0.695	-9.5439	.9716
28	21 Sagittarii	6	+69	+13	4 37.2	-5	47 52	+0.8710	.6114	+0.698	-9.5510	.9706
28	B.A.C. 6536	6½	+24	-39	8 47.3	-1	48 5	-0.0115	.6102	+1.967	-9.5235	.9743
28	d Sagittarii	5	+30	-33	12 20.9	+1	36 44	+0.0798	.6101	+1.147	-9.5169	.9751
28	e¹ Sagittarii	4	-19	-90	13 54.6	+3	6 34	-0.8079	.6090	+1.186	-9.4923	.9780
28	e² Sagittarii	5½	+7	-60	13 57.6	+3	9 25	-0.3543	.6095	+1.186	-9.5028	.9768
28	B.A.C. 6658	6	+26	-37	16 20.7	+5	26 40	+0.0079	.6079	+1.237	-9.5045	.9766
29	g Sagittarii	5½	-40	-90	3 54.1	-7	28 4	-1.1389	.6035	+1.483	-9.6363	.9832
29	β Capricor.	3	+12	-59	12 56.0	+1	12 9	-0.3477	.5992	+1.653	-9.4188	.9845
29	r¹ Capricor	6	+75	+34	19 24.1	+7	25 0	+1.1574	.5955	+1.764	-9.4201	.9837
29	r² Capricor.	5	+75	+30	20 10.5	+8	9 35	+1.1122	.5954	+1.774	-9.4250	.9841
30	B.A.C. 7242	6	-36	-90	1 46.7	-10	27 22	-1.1442	.5922	+1.861	-9.3208	.9903
30	8 Aquarii	6	+77	+9	4 31.0	-7	49 19	+0.8316	.5905	+1.899	-9.3705	.9877
30	ν Aquarii	4½	+32	-40	8 28.6	-4	0 54	-0.0307	.5882	+1.950	-9.3150	.9905
30	17 Aquarii	6	-17	-90	13 59.8	+1	17 47	-0.9220	.5852	+2.014	-9.2351	.9935
30	19 Aquarii	6	+18	-56	14 55.7	+2	11 36	-0.3135	.5849	+2.024	-9.2535	.9929
30	ξ Aquarii	4½	-27	-90	20 9.6	+7	13 47	-1.0742	.5817	+2.076	-9.1677	.9952
30	c¹ Capricor.	6	+81	+5	23 11.5	+10	8 54	+0.7839	.5798	+2.104	-9.2267	.9937
30	c² Capricor	6½	+80	+26	23 43.2	+10	39 28	+1.0889	.5796	+2.109	-9.2353	.9935
31	30 Aquarii	5½	+33	-41	6 57.3	-6	22 23	-0.0524	.5756	+2.161	-9.0968	.9966
31	44 Aquarii	6	+45	-30	12 53.9	-0	38 44	+0.1413	.5725	+2.195	-9.0239	.9976
31	51 Aquarii	6	+53	-23	15 55.6	+2	16 29	+0.2726	.5712	+2.208	-8.9835	.9980
31	α Aquarii	5	+85	+19	21 52.6	+8	0 46	+1.0021	.5681	+2.227	-8.9340	9.9984
Aug. 1	3 Piscium	6	-28	-90	7 58.8	-6	14 18	-1.1130	.5635	+2.241	-7.9762	0.0000
1	B.A.C. 8152	6½	+90	+26	18 12.5	+3	38 13	+1.0877	.5595	+2.231	-7.8997	.0000
1	π Piscium	4½	+66	-13	19 44.7	+5	7 13	+0.4563	.5590	+2.227	-7.9518	.0000
1	9 Piscium	6	+81	-4	19 53.5	+5	15 43	+0.6267	.5589	+2.226	-7.8173	.0000
1	15 Piscium	6½	+90	+43	23 36.7	+8	51 17	+1.2671	.5576	+2.215	-7.9920	0.0000
2	16 Piscium	6	+75	-7	0 1.8	+9	15 29	+0.5644	.5576	+2.214	+8.3721	9.9999
2	19 Piscium	6	+47	-29	4 34.0	-10	21 29	+0.1656	.5559	+2.196	+8.6786	.9995
2	22 Piscium	6	+90	+46	7 5.9	-7	54 43	+1.2874	.5553	+2.185	+8.5795	.9997
2	d Piscium	5½	-42	-83	20 12.8	+4	45 40	-1.2575	.5525	+2.106	+9.1120	.9963
2	45 Piscium	6	+24	-51	22 33.4	+7	1 35	-0.2589	.5518	+2.087	+9.0822	.9968
3	51 Piscium	6½	+90	+32	1 38.9	+10	0 56	+1.1374	.5512	+2.062	+9.0339	.9975
4	101 Piscium	6	-50	-76	6 59.0	-9	37 16	-1.2359	.5487	+1.756	+9.3827	.9870
4	104 Piscium	6½	+4	-71	8 36.0	-8	3 33	-0.6167	.5485	+1.733	+9.3712	.9877
5	27 Arietis	6	+6	-64	8 32.5	-8	54 24	-0.5750	.5487	+1.394	+9.4684	.9804
5	40 Arietis	6	+29	-45	16 42.1	-1	1 1	-0.1496	.5490	+1.263	+9.4833	.9789
5	π Arietis	5½	+90	-15	17 4.2	-0	39 40	+0.7754	.5490	+1.259	+9.4633	.9808
5	q¹ Arietis	7½	+90	+17	19 40.2	+1	51 11	+0.7936	.5494	+1.215	+9.4704	.9802
5	q² Arietis	6	+50	-16	20 4.4	+2	14 31	+0.2016	.5494	+1.210	+9.4848	.9788
5	q³ Arietis	6	+76	+3	20 20.9	+2	30 28	+0.5560	.5494	+1.205	+9.4776	.9795
6	53 Arietis	6	+90	+64	1 27.5	+7	26 58	+1.2885	.5495	+1.118	+9.4746	.9798
6	54 Arietis	6½	+59	-7	1 51.9	+7	50 28	+0.3460	.5495	+1.112	+9.4962	.9775
6	δ Arietis	4½	+10	-56	3 21.3	+9	16 55	-0.5018	.5497	+1.087	+9.5173	.9751
6	B.A.C. 1032	6½	-16	-70	7 37.0	-10	35 52	-0.9237	.5498	+1.012	+9.5343	.9729
6	τ¹ Arietis	6	-31	-70	8 29.5	-9	45 6	-1.0940	.5499	+0.996	+9.5312	.9723
6	65 Arietis	6	-30	-70	9 15.7	-9	0 23	-1.0879	.5499	+0.984	+9.5466	.9721
6	13 Tauri	6½	+90	+22	17 32.7	-0	59 55	+0.8072	.5502	+0.835	+9.5184	.9750
7	A¹ Tauri	4½	-31	-69	3 49.0	+8	55 55	-1.0894	.5504	+0.646	+9.5680	.9681
7	A² Tauri	6	-23	-69	4 6.6	+9	12 53	-0.9977	.5504	+0.642	+9.5667	.9683
7	ω³ Tauri	5½	+90	+28	9 40.2	-9	24 38	+0.8572	.5504	+0.637	+9.5390	.9723
7	53 Tauri	6½	+56	-5	10 39.2	-8	27 33	+0.2862	.5505	+0.519	+9.5506	9.9707

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		<i>H</i>	<i>Y</i>	<i>p'</i>	<i>q'</i>	Log sin <i>D</i>	Log cos <i>D</i>
Aug. 7	56 Tauri	6½	+15	-44	10 43.3	- 8 23 37	-0.4016	0.5505	+0.0518	+9.5629	9.9689
7	α^1 Tauri	5½	-13	-68	13 21.5	- 5 50 42	-0.8586	.5503	+0.0470	+9.5731	9.672
7	α^2 Tauri	6½	- 6	-68	13 23.1	- 5 49 5	-0.7556	.5503	+0.0466	+9.5714	9.675
8	β Tauri	5	+58	+ 1	6 51.5	+11 4 30	+0.3143	.5495	+0.0136	+9.5619	9.690
8	105 Tauri	6	+50	- 5	9 6.2	-10 45 15	+0.1970	.5494	+0.0094	+9.5645	9.686
8	α Tauri	6	+23	-30	14 22.6	- 5 39 19	-0.2549	.5488	-0.0008	+9.5726	9.673
8	α Tauri	6	+31	-23	18 16.9	- 1 52 46	-0.1228	.5484	-0.0080	+9.5701	9.677
8	β Tauri	3½	+90	+19	22 59.1	+ 2 40 15	+0.6600	.5478	-0.0168	+9.5554	9.700
9	B.A.C. 1835	6½	+90	+23	4 1.4	+ 7 32 39	+0.8155	.5469	-0.0262	+9.5507	9.707
9	141 Tauri	6	-36	-68	10 15.4	-10 25 33	-1.1296	.5460	-0.0378	+9.5909	9.659
9	B.A.C. 1970	6½	-30	-68	13 58.1	- 6 50 8	-1.0784	.5455	-0.0446	+9.5775	9.665
9	15 Geminor.	6	+35	-24	22 40.6	+ 1 35 30	-0.0502	.5438	-0.0602	+9.5518	9.705
9	16 Geminor.	6	+55	- 6	22 46.1	+ 1 40 45	+0.2731	.5437	-0.0603	+9.5458	9.714
9	γ Geminor.	4	+77	+ 9	23 15.6	+ 2 9 19	+0.5527	.5434	-0.0610	+9.5401	9.722
10	δ Geminor.	4	-51	-69	16 9.8	- 5 28 51	-1.2508	.5396	-0.0939	+9.5497	9.708
11	B.A.C. 2432	6½	+58	- 8	1 29.3	+ 3 33 2	+0.3261	.5370	-0.1046	+9.5022	9.769
11	γ Geminor.	6	+40	-25	9 34.5	+11 23 11	+0.0414	.5349	-0.1169	+9.4896	9.782
11	γ Geminor.	5½	-63	-71	12 46.2	- 9 31 16	-1.3029	.5343	-0.1215	+9.5082	9.761
11	1 Cancri	6	+90	+29	18 20.0	- 4 7 32	+0.9963	.5326	-0.1201	+9.4444	9.825
11	3 Cancri	6	-17	-73	20 11.5	- 2 19 29	-0.9423	.5321	-0.1317	+9.4824	9.790
11	5 Cancri	6	+35	-31	20 34.3	- 1 57 25	-0.0480	.5320	-0.1323	+9.4617	9.810
12	B.A.C. 2731	6½	-51	-73	0 49.8	+ 2 10 20	-1.2723	.5308	-0.1379	+9.4760	9.796
15	34 Sextantis	6	- 9	-86	8 25.0	+ 7 25 17	-0.8533	.5181	-0.2028	+8.8744	9.988
15	36 Sextantis	6	+41	-34	9 45.6	+ 8 43 33	+0.0678	.5181	-0.2031	+8.7474	9.993
15	B.A.C. 3726	6	+90	-13	13 30.1	-11 38 30	+0.8984	.5182	-0.2041	+8.4848	9.998
15	55 Leonis	6	+90	+ 9	15 19.9	- 9 51 52	+0.8373	.5184	-0.2044	+8.4072	9.999
15	β^1 Leonis	6	+90	+ 6	19 30.8	- 5 48 8	+0.7785	.5186	-0.2051	+8.1068	0.0000
16	β^2 Leonis	5	+24	-52	0 51.5	- 0 36 46	-0.2555	.5190	-0.2058	+8.0702	0.0000
16	ϵ Leonis	5	+88	+30	9 32.3	+ 7 48 54	+1.1421	.5202	-0.2060	+8.5944	9.997
17	Venus	- 2	- 88	-88	13 11.8	+10 39 21	-0.6821	.5080	-0.1826	-9.0023	9.978
17	χ Virginis	5	+ 3	-79	20 53.2	- 5 53 13	-0.6078	.5303	-0.1954	-9.1007	9.965
17	B.A.C. 4259	6	+ 5	-75	20 57.2	- 5 49 22	-0.5877	.5314	-0.1962	-9.1129	9.965
18	B.A.C. 4312	6½	+78	+ 4	2 54.7	- 0 2 52	+0.7496	.5327	-0.1915	-9.2219	9.939
18	ψ Virginis	5	+14	-61	4 23.4	+ 1 23 7	-0.3875	.5335	-0.1904	-9.1845	9.949
18	γ Virginis	6	+16	-58	11 2.0	+ 7 49 21	-0.3388	.5365	-0.1856	-9.2402	9.934
18	50 Virginis	6	-19	-90	11 56.7	+ 8 42 19	-0.9443	.5370	-0.1849	-9.2222	9.939
18	ι Virginis	5	+40	-31	20 8.2	- 7 21 46	+0.1242	.5412	-0.1776	-9.3178	9.904
18	B.A.C. 4531	6	+33	-37	23 55.6	- 3 41 41	+0.0078	.5434	-0.1739	-0.3357	9.986
19	B.A.C. 4679	6½	+ 9	-63	13 51.0	+ 9 46 25	-0.4007	.5514	-0.1581	-9.3931	9.963
19	B.A.C. 4700	5½	+65	- 7	16 45.8	-11 24 37	+0.5595	.5531	-0.1543	-9.4312	9.936
20	B.A.C. 4896	6	+ 7	-62	11 0.7	+ 6 12 44	-0.3810	.5648	-0.1275	-9.4714	9.801
20	β^1 Libræ	4½	+69	+ 1	19 56.9	- 9 10 10	+0.6828	.5706	-0.1124	-9.5187	9.750
20	β^2 Libræ	6½	+54	-11	20 25.4	- 8 42 38	+0.4787	.5708	-0.1113	-9.5155	9.754
21	B.A.C. 5109	6½	+ 8	-56	4 37.8	- 0 48 8	-0.2954	.5764	-0.0960	-9.5171	9.751
21	41 Libræ	6	-28	-90	7 16.9	+ 1 45 9	-0.9084	.5777	-0.0910	-9.5092	9.761
21	α Libræ	5	-11	-84	8 33.4	+ 2 58 45	-0.6249	.5786	-0.0883	-9.5178	9.751
21	λ Libræ	6	- 4	-70	13 17.1	+ 7 31 56	-0.4793	.5804	-0.0788	-9.5290	9.737
21	B.A.C. 5281	6	+35	-25	15 11.7	+ 9 22 13	+0.2247	.5826	-0.0749	-9.5461	9.714
21	β^1 Scorpii	2	-53	-90	18 17.0	-11 39 29	-1.1817	.5844	-0.0683	-9.5220	9.745
21	β^2 Scorpii	5½	-53	-90	18 17.1	-11 39 22	-1.1849	.5844	-0.0683	-9.5219	9.746
21	ω^1 Scorpii	4½	+ 4	-58	18 49.6	-11 8 1	-0.3276	.5848	-0.0669	-9.5401	9.722
21	ω^2 Scorpii	4½	+14	-46	19 3.8	-10 54 22	-0.1376	.5855	-0.0665	-9.5442	9.716
21	B.A.C. 5395	6	+36	-22	21 37.6	- 8 26 28	+0.2664	.5863	-0.0609	-9.5553	9.700
22	ω Ophiuchi	5	+19	-38	5 5.7	- 1 15 30	-0.0029	.5901	-0.0443	-9.5576	9.697
22	B.A.C. 5758	6	+ 6	-49	18 40.5	+11 47 28	-0.1857	0.5959	-0.0123	-9.5616	9.691

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Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Aug. 23	ξ Ophiuchi	5	-19	-86	h m 0 30.1	h m s - 6 36 40	-0.6294	0.5980	+0.019	-9.5536	9.9702
23	B.A.C. 5866	6	+1	-55	1 57.5	- 5 12 46	-0.2724	.5983	+0.051	-9.5604	.9692
23	B.A.C. 5854	6	+35	-20	7 26.8	+ 0 3 28	+0.3154	.5998	+0.189	-9.5703	.9677
23	58 Ophiuchi	5	+25	-30	9 17.1	+ 1 49 21	+0.1370	.5998	+0.233	-9.5662	.9683
23	B.A.C. 6081	6½	-36	-90	15 45.9	+ 8 2 30	-0.9617	.6016	+0.392	-9.5408	.9721
23	B.A.C. 6098	6	- 8	-72	16 46.4	+ 9 0 36	-0.5018	.6017	+0.419	-9.5490	.9709
23	μ¹ Sagittarii	4	+22	-34	21 5.7	-10 50 28	+0.0596	.6020	+0.0526	-9.5561	.9699
23	14 Sagittarii	6	+68	+ 4	21 16.6	-10 40 3	+0.7252	.6020	+0.0527	-9.5688	.9679
23	15 Sagittarii	5	+ 7	-52	21 40.0	-10 17 36	-0.2359	.6021	+0.0538	-9.5497	.9708
23	16 Sagittarii	6	-11	-80	21 40.6	-10 16 58	-0.5764	.6021	+0.0538	-9.5428	.9718
24	21 Sagittarii	5	+12	-47	1 36.4	- 6 30 41	-0.1597	.6021	+0.0636	-9.5466	.9713
24	B.A.C. 6336	6½	+69	+29	6 27.8	- 1 51 1	+1.0718	.6024	+0.0751	-9.5642	.9687
24	B.A.C. 6347	6½	+69	+ 6	6 51.6	- 1 28 11	+0.7563	.6023	+0.0760	-9.5575	.9697
24	29 Sagittarii	6	+47	-14	11 3.5	+ 2 33 40	+0.4128	.6020	+0.0663	-9.5439	.9714
24	ξ¹ Sagittarii	6	+69	+26	14 2.3	+ 5 25 12	+1.0311	.6019	+0.0929	-9.5510	.9706
24	B.A.C. 6536	6½	+31	-30	18 20.0	+ 9 32 38	+0.1276	.6012	+0.1027	-9.5235	.9743
24	d Sagittarii	5	+37	-26	21 59.9	-10 56 15	+0.2122	.6006	+0.1111	-9.5169	.9751
24	q¹ Sagittarii	4	-12	-90	23 36.2	- 9 23 48	-0.6899	.6003	+0.1147	-9.4922	.9780
24	q² Sagittarii	5½	+13	-52	23 39.2	- 9 20 55	-0.2308	.6003	+0.1147	-9.5027	.9768
25	B.A.C. 6658	6	+33	-30	2 6.2	- 6 59 44	+0.1305	.5997	+0.1198	-9.5044	.9766
25	q Sagittarii	5½	-34	-90	13 57.0	+ 4 22 52	-1.0549	.5968	+0.1443	-9.4364	.9832
25	B.A.C. 6992	6½	+15	-55	23 4.3	-10 51 12	-0.2900	.5938	+0.1611	-9.4189	.9845
25	β Capricor.	3	+15	-54	23 10.0	-10 45 42	-0.2768	.5938	+0.1613	-9.4188	.9845
26	τ¹ Capricor.	6	+75	+42	5 44.9	-4 26 6	+1.2238	.5912	+0.1724	-9.4301	.9837
26	τ² Capricor.	5	+75	+36	6 32.0	- 3 40 49	+1.1765	.5909	+0.1737	-9.4250	.9841
26	B.A.C. 7221	6½	+14	-59	11 12.9	+ 0 49 17	-0.3456	.5891	+0.1807	-9.3536	.9886
26	B.A.C. 7242	6	-34	-90	12 12.8	+ 1 46 55	-1.1110	.5887	+0.1822	-9.3208	.9903
26	8 Aquarii	6	+77	+11	14 59.1	+4 26 56	+0.8702	.5876	+0.1862	-9.3705	.9877
26	γ Aquarii	4½	+33	-38	18 59.2	+ 8 17 53	-0.0079	.5860	+0.1915	-9.3150	.9905
27	19 Aquarii	6	+18	-56	1 29.3	- 9 26 36	-0.3092	.5833	+0.1994	-9.2535	.9929
27	ξ Aquarii	4½	-29	-90	6 44.8	- 4 22 51	-1.0859	.5810	+0.2048	-9.1677	.9952
27	c¹ Capricor.	6	+73	+ 5	9 47.2	- 1 27 14	+0.7689	.5800	+0.2077	-9.2269	.9937
27	30 Aquarii	5½	+31	-43	17 33.2	+ 6 1 42	-0.0906	.5769	+0.3139	-9.0967	.9966
27	44 Aquarii	6	+41	-33	23 28.8	+11 44 20	+0.0669	.5747	+0.2177	-9.0237	.9976
28	51 Aquarii	6	+49	-26	2 29.6	- 9 21 20	+0.2098	.5737	+0.2192	-8.9834	.9980
28	π Aquarii	5	+85	+14	8 24.1	- 3 39 36	+0.9218	.5715	+0.2215	-8.9339	9.9984
28	3 Piscium	6	-37	-90	18 24.0	+ 5 59 3	-1.2134	.5681	+0.2234	-7.9816	0.0000
29	π Piscium	4½	+56	-23	5 59.5	- 6 49 50	+0.3192	.5651	+0.2226	+7.9460	.0000
29	9 Piscium	6	+63	-11	6 8.0	- 6 41 40	+0.4862	.5651	+0.2226	+7.8099	0.0000
29	16 Piscium	6	+63	-15	10 12.2	- 2 45 55	+0.4171	.5649	+0.2216	+8.3700	9.9999
29	ι Piscium	5	+90	+47	12 43.3	- 0 20 9	+1.2930	.5635	+0.2209	+8.2564	.9999
29	19 Piscium	6	+38	-37	14 39.3	+ 1 31 54	+0.0093	.5629	+0.2201	+8.6787	.9995
29	22 Piscium	6	+90	+29	17 8.2	+ 3 55 38	+1.1166	.5626	+0.2191	+8.5797	.9997
30	45 Piscium	6	+13	-64	8 15.2	- 5 28 31	-0.4496	.5599	+0.2099	+9.0822	.9968
30	51 Piscium	6½	+90	+16	11 16.3	- 2 33 40	+0.9264	.5594	+0.2075	+9.0339	.9975
31	π Piscium	5	+90	+43	16 29.0	+ 1 39 16	+1.2067	.5572	+0.1762	+9.2976	.9913
31	104 Piscium	6½	-11	-77	17 25.6	+ 2 34 1	-0.8561	.5572	+0.1749	+9.3712	.9877
Sept. 1	27 Arietis	6	-10	-73	16 45.5	+ 1 6 17	-0.8371	.5563	+0.1407	+9.4684	.9804
2	40 Arietis	6	+14	-52	0 43.4	+ 8 48 0	-0.4215	.5567	+0.1275	+9.4833	.9789
2	π Arietis	5½	+70	- 1	1 4.9	+ 9 8 48	+0.4926	.5565	+0.1270	+9.4632	.9808
2	q¹ Arietis	7½	+72	0	3 37.4	+11 36 2	+0.5093	.5565	+0.1226	+9.4705	.9802
2	q² Arietis	6	+33	-31	4 1.0	+11 58 51	-0.0762	.5565	+0.1221	+9.4848	.9783
2	q³ Arietis	6	+54	-12	4 17.1	-11 45 34	+0.2743	.5565	+0.1215	+9.4776	.9795
2	53 Arietis	6	+90	+31	9 17.0	- 6 55 51	+0.9365	.5563	+0.1134	+9.4746	.9798
2	54 Arietis	6½	+41	-22	9 40.8	- 6 32 53	+0.0645	0.5563	+0.1121	+9.4963	9.9775

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Sept. 2	δ Arietis	4½	-7	-71	11 8.3	-5 8 23	-0.7745	0.5563	+1.006	+9.5173	9.9751
2	B.A.C. 1032	6½	-42	-70	15 18.6	-1 6 32	-1.1934	.5562	+1.022	+9.5344	.9729
3	13 Tauri	6½	+73	+5	1 2.9	+8 17 54	+0.5187	.5559	+0.045	+9.5184	.9750
3	A ² Tauri	6	-58	-69	11 26.0	-5 40 7	-1.2688	.5550	+0.0648	+9.5668	.9683
3	ω ² Tauri	5½	+78	+11	16 54.5	-0 22 43	+0.5705	.5545	+0.0545	+9.5391	.9723
3	53 Tauri	6½	+38	-20	17 52.7	+0 33 32	+0.0048	.5545	+0.0526	+9.5507	.9707
3	56 Tauri	6½	-1	-65	17 56.6	+0 37 22	-0.6770	.5545	+0.0525	+9.5630	.9689
3	π ¹ Tauri	5½	-36	-68	20 32.7	+3 8 10	-1.1301	.5542	+0.0475	+9.5732	.9672
3	π ² Tauri	6½	-26	-68	20 34.3	+3 9 43	-1.0278	.5542	+0.0474	+9.5714	.9675
4	ι Tauri	5	+40	-14	13 50.8	-4 8 36	+0.0409	.5518	+0.0143	+9.5619	.9690
4	105 Tauri	6	+33	-20	16 4.3	-1 59 35	-0.0744	.5514	+0.0105	+9.5645	.9686
4	η Tauri	6	+8	-48	21 18.1	+3 3 45	-0.5204	.5506	+0.0001	+9.5726	.9673
5	ο Tauri	6	+16	-38	1 10.7	+6 48 40	-0.3863	.5498	-0.0071	+9.5701	.9677
5	B.A.C. 1733	6½	+90	+55	4 0.6	+9 32 54	+1.1727	.5493	-0.0125	+9.5417	.9790
5	ζ Tauri	3½	+63	+5	5 51.2	+11 19 52	+0.3959	.5490	-0.0160	+9.5564	.9700
5	B.A.C. 1835	6½	+77	+13	10 51.9	-7 49 18	+0.5548	.5478	-0.0254	+9.5507	.9707
5	χ ¹ Orionis	5	+90	+48	13 42.7	-5 4 11	+1.1038	.5473	-0.0307	+9.5392	.9723
5	χ ² Orionis	5	+90	+45	18 10.9	-0 44 41	+1.0705	.5463	-0.0387	+9.5669	.9726
6	16 Geminor.	6	+21	-37	5 27.7	+10 10 4	-0.2876	.5435	-0.0588	+9.5518	.9705
6	15 Geminor.	6	+39	-19	5 33.0	+10 15 11	+0.0344	.5434	-0.0590	+9.5458	.9714
6	ν Geminor.	4	+57	-4	6 2.4	+9 43 42	+0.3139	.5434	-0.0597	+9.5401	.9722
7	B.A.C. 2432	6½	+45	-19	8 15.6	-11 53 7	+0.1236	.5360	-0.1027	+9.5022	.9769
7	ζ Geminor.	6	+29	-35	16 21.1	-4 2 46	-0.1478	.5347	-0.1147	+9.4896	.9782
8	1 Cancri	6	+90	+17	1 6.7	+4 26 44	+0.8206	.5316	-0.1271	+9.4443	.9825
8	3 Cancri	6	-31	-73	2 58.3	+6 14 53	-1.1107	.5311	-0.1296	+9.4824	.9790
8	5 Cancri	6	+25	-41	3 21.1	+6 36 57	-0.2180	.5311	-0.1300	+9.4617	.9810
8	29 Cancri	6	+54	-15	17 5.3	-4 3 48	+0.2792	.5277	-0.1475	+9.4032	.9856
8	B.A.C. 2872	6½	+90	+21	19 43.2	-1 30 42	+0.9239	.5271	-0.1507	+9.3751	.9874
9	A ¹ Cancri	6	+90	+13	0 33.4	+3 10 47	+0.7947	.5260	-0.1561	+9.3575	.9884
9	A ² Cancri	6	+90	+34	2 29.0	+5 2 58	+1.1110	.5259	-0.1582	+9.3391	.9884
9	60 Cancri	6	+90	+17	7 6.3	+9 32 2	+0.8798	.5248	-0.1630	+9.3320	.9902
9	α Cancri	4	+62	-11	8 24.9	+10 48 15	+0.4024	.5247	-0.1644	+9.3313	.9908
9	κ Cancri	5	+90	+17	13 13.2	-8 32 2	+0.8913	.5238	-0.1690	+9.2890	.9916
9	B.A.C. 3122	6½	+22	-49	14 15.0	-7 32 2	-0.2805	.5236	-0.1706	+9.3220	.9902
9	ω Leonis	6	+90	+6	23 58.9	+1 54 39	+0.7456	.5223	-0.1788	+9.2941	.9938
10	λ Leonis	6	+20	-53	1 47.8	+3 40 24	-0.3149	.5220	-0.1803	+9.2430	.9929
10	π Leonis	5	-46	-82	16 34.8	-5 58 34	-1.2791	.5207	-0.1908	+9.1795	.9950
10	14 Sextantis	6	+88	+3	20 3.4	-2 36 0	+0.7114	.5207	-0.1929	+9.0386	.9974
10	16 Sextantis	6	+29	-45	21 20.1	-1 21 33	-0.1531	.5207	-0.1936	+9.0758	.9969
14	χ Virginis	5	+11	-65	2 34.9	+1 35 47	-0.4504	.5351	-0.1948	-9.1007	.9965
14	B.A.C. 4259	6	+13	-64	2 38.8	+1 39 36	-0.4232	.5351	-0.1948	-9.1029	.9965
14	28 Virginis	6	-43	-90	3 55.0	+2 53 25	-1.2307	.5359	-0.1942	-9.0701	.9970
14	B.A.C. 4312	6½	+81	+14	8 31.9	+7 21 47	+0.9131	.5376	-0.1912	-9.2280	.9939
14	ψ Virginis	5	+23	-50	9 59.6	+8 46 43	-0.2188	.5383	-0.1902	-9.1845	.9949
14	γ Virginis	6	+26	-47	16 33.7	-8 51 40	-0.1580	.5411	-0.1852	-9.2402	.9934
14	50 Virginis	6	-7	-90	17 27.8	-7 59 15	-0.7601	.5417	-0.1844	-9.2222	.9939
14	MERCURY		-16	-90	18 23.4	-7 5 25	-0.8776	.5049	-0.1621	-9.2245	.9938
15	α Virginis	1	-41	-90	0 51.1	-0 50 7	-1.1970	.5453	-0.1779	-9.2585	.9927
15	ι Virginis	5	+52	-20	1 34.3	-0 8 20	+0.3181	.5456	-0.1771	-9.3178	.9904
15	B.A.C. 4531	6	+45	-26	5 19.6	+3 29 42	+0.2079	.5474	-0.1736	-9.3357	.9896
15	B.A.C. 4679	6½	+21	-48	19 9.0	-7 8 15	-0.1810	.5546	-0.1575	-9.3031	.9863
15	B.A.C. 4700	5½	+75	+7	22 3.0	+4 20 7	+0.7818	.5560	-0.1538	-9.4312	.9836
16	B.A.C. 4896	6	+20	-46	16 15.9	-10 44 49	-0.1415	.5658	-0.1270	-9.4714	.9801
17	δ Libræ	4½	+71	+18	1 13.4	-2 6 17	+0.9331	.5708	-0.1117	-9.5187	.9750
17	ε Libræ	6½	+71	+4	1 42.1	-1 38 37	+0.7273	.05712	-0.1104	-9.5154	9.9754

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Sept. 17	B. A. C. 5109	6½	+22	-40	9 57.4	+ 6 18 51	-0.0450	0.5752	-.0952	-9.5170	9.9751
17	41 Libræ	6	-12	-88	12 37.8	+ 8 53 22	-0.6598	.5766	-.0900	-9.5002	.9761
17	κ Libræ	5	+ 3	-61	13 54.9	+10 7 38	-0.3734	.5773	-.0876	-9.5177	.9751
17	λ Libræ	6	+10	-51	18 41.5	- 9 16 21	-0.2268	.5796	-.0779	-9.5289	.9737
17	ρ¹ Scorpii	2	-32	-90	23 44.9	- 4 24 12	-0.9317	.5817	-.0674	-9.5220	.9745
17	ρ² Scorpii	5½	-32	-90	23 45.0	- 4 24 5	-0.9352	.5817	-.0674	-9.5219	.9746
18	ω² Scorpii	4½	+17	-42	0 18.0	- 3 52 20	-0.0721	.5821	-.0660	-9.5401	.9722
18	ω³ Scorpii	4½	+28	-31	0 32.4	- 3 38 29	+0.1193	.5820	-.0658	-9.5442	.9716
18	B. A. C. 5395	6	+53	- 8	3 8.2	- 1 8 28	+0.5264	.5832	-.0604	-9.5553	.9700
18	ψ Ophiuchi	5	-45	-90	7 27.6	+ 3 1 12	-1.0909	.5848	-.0510	-9.5280	.9738
18	ω Ophiuchi	5	+34	-23	10 43.3	+ 6 9 29	+0.2558	.5860	-.0437	-9.5576	.9697
18	B. A. C. 5663	6½	-45	-90	19 25.4	- 9 28 17	-1.0524	.5888	-.0241	-9.5379	.9725
19	B. A. C. 5758	6	+20	-33	0 34.0	- 4 31 34	+0.0697	.5902	-.0123	-9.5616	.9691
19	ξ Ophiuchi	5	- 6	-62	6 31.7	+ 1 12 24	-0.3810	.5916	+0.0015	-9.5536	.9702
19	B. A. C. 5866	6	+14	-39	8 1.2	+ 2 38 25	-0.0205	.5916	+0.0048	-9.5604	.9692
19	B. A. C. 5964	6	+53	- 5	13 39.0	+ 8 3 6	+0.5714	.5925	+0.0182	-9.5703	.9677
19	58 Ophiuchi	5	+40	-15	15 32.2	+ 9 51 53	+0.3898	.5926	+0.0226	-9.5662	.9683
19	B. A. C. 6081	6½	-21	-90	22 11.7	- 7 44 7	-0.7165	.5932	+0.0378	-9.5408	.9721
19	B. A. C. 6098	6	+ 4	-54	23 14.0	- 6 44 18	-0.2611	.5932	+0.0414	-9.5490	.9709
20	μ¹ Sagittarii	4	+37	-20	3 41.0	- 2 27 41	+0.3039	.5936	+0.0509	-9.5561	.9609
20	14 Sagittarii	6	+69	+22	3 52.1	- 2 16 57	+0.9781	.5933	+0.0513	-9.5688	.9679
20	15 Sagittarii	5	+20	-37	4 16.3	- 1 53 44	+0.0039	.5932	+0.0521	-9.5497	.9708
20	16 Sagittarii	6	+ 1	-59	4 16.8	- 1 53 13	-0.3410	.5932	+0.0522	-9.5428	.9718
20	21 Sagittarii	5	+25	-33	8 19.9	+ 2 0 24	+0.0780	.5932	+0.0614	-9.5466	.9713
20	B. A. C. 6347	6½	+69	+24	13 45.0	+ 7 12 50	+1.0018	.5928	+0.0739	-9.5575	.9697
20	29 Sagittarii	6	+65	- 1	18 5.1	+11 22 51	+0.6492	.5922	+0.0835	-9.5439	.9716
20	ξ¹ Sagittarii	6	+69	+58	21 9.8	- 9 39 38	+1.2735	.5921	+0.0903	-9.5510	.9706
21	B. A. C. 6536	6½	+44	-18	1 36.1	- 5 23 38	+0.3514	.5914	+0.1000	-9.5234	.9743
21	d Sagittarii	5	+51	-13	5 23.4	- 1 45 3	+0.4334	.5906	+0.1080	-9.5168	.9751
21	e¹ Sagittarii	4	- 1	-70	7 3.0	- 0 9 19	-0.4849	.5902	+0.1111	-9.4922	.9780
21	e² Sagittarii	5½	+24	-38	7 6.2	- 0 6 15	-0.0185	.5902	+0.1113	-9.5027	.9768
21	B. A. C. 6658	6	+46	-18	9 36.2	+ 2 17 54	+0.3449	.5897	+0.1167	-9.5044	.9766
21	e³ Sagittarii	6	-36	-90	14 49.1	+ 7 18 56	-1.0659	.5884	+0.1269	-9.4559	.9815
21	e⁴ Sagittarii	5	-42	-90	15 33.3	+ 8 1 27	-1.1353	.5883	+0.1253	-9.4517	.9819
21	g Sagittarii	5½	-21	-90	21 53.2	- 9 53 9	-0.8768	.5865	+0.1402	-9.4363	.9832
22	B. A. C. 6992	6½	+24	-44	7 19.0	- 0 48 39	-0.1154	.5840	+0.1566	-9.4189	.9845
22	β Capricor.	3	+24	-43	7 24.9	- 0 43 1	-0.1024	.5838	+0.1569	-9.4188	.9845
22	B. A. C. 7221	6½	+21	-49	19 50.0	+11 14 16	-0.1954	.5800	+0.1759	-9.3535	.9886
22	B. A. C. 7242	6	-23	-90	20 52.9	-11 45 5	-0.9738	.5796	+0.1773	-9.3208	.9903
22	8 Aquarii	6	+77	+23	23 44.4	- 8 59 52	+1.0297	.5786	+0.1812	-9.3705	.9677
23	ν Aquarii	4½	+40	-30	3 51.6	- 5 1 43	+0.1303	.5776	+0.1863	-9.3150	.9905
23	17 Aquarii	6	-10	-90	9 35.2	+ 0 29 17	-0.8042	.5757	+0.1933	-9.2351	.9935
23	19 Aquarii	6	+24	-48	10 33.0	+ 1 25 3	-0.1898	.5754	+0.1943	-9.2535	.9929
23	ξ Aquarii	4½	-22	-90	15 57.0	+ 6 37 17	-0.9888	.5745	+0.1998	-0.1676	.9952
23	c¹ Capricor.	6	+81	+12	19 4.1	+ 9 37 37	+0.8820	.5728	+0.2028	-9.2267	.9937
23	c² Capricor.	6½	+80	+36	19 36.7	+10 9 3	+1.1885	.5728	+0.2032	-9.2353	.9935
24	30 Aquarii	5½	+35	-38	3 1.2	- 6 42 19	-0.0073	.5753	+0.2090	-9.0967	.9966
24	44 Aquarii	6	+45	-29	9 4.3	- 0 52 6	+0.1569	.5723	+0.2129	-9.0237	.9976
24	51 Aquarii	6	+52	-23	12 8.7	+ 2 5 48	+0.2732	.5710	+0.2146	-8.9834	.9980
24	κ Aquarii	5	+85	+18	18 9.6	+ 7 53 57	+0.9754	.5685	+0.2171	-8.9339	.99984
25	3 Piscium	6	-37	-90	4 18.2	- 6 18 39	-1.2034	.5656	+0.2196	-7.9752	6.0000
25	κ Piscium	4½	+56	-21	16 0.8	+ 4 59 33	+0.3092	.5638	+0.2196	+7.9530	.0000
25	9 Piscium	6	+67	-12	16 9.3	+ 5 7 41	+0.4774	.5638	+0.2195	+7.8190	.00000
25	16 Piscium	6	+61	-16	20 15.1	+ 9 5 2	+0.3050	.5635	+0.2187	+8.3726	.99999
25	λ Piscium	5	+90	+44	22 47.1	+11 31 47	+1.2685	.5635	+0.2181	+8.2566	.99999

**ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.**

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of Conj.	At Washington Mean Time of Conjunction.							
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D		
					h m	h m s							
Sept. 26	19 Piscium	6	+26	-39	0 43.6	-10 35 46	-0.0252	0.5635	+2174	+8.6788	9.9886		
26	22 Piscium	6	+90	+26	3 13.0	-8 11 27	+1.0714	.5637	+2166	+8.5798	9.997		
26	45 Piscium	6	+9	-69	18 20.1	+6 24 23	-0.5285	.5621	+2083	+9.0823	9.968		
28	π Piscium	5	+90	+29	2 17.4	-10 44 11	+1.0515	.5630	+1759	+9.2897	9.916		
28	104 Piscium	6½	-21	-77	3 13.8	-9 50 13	-1.0051	.5627	+1746	+9.3712	9.977		
29	27 Arietis	6	-24	-73	2 11.1	-11 40 3	-1.0240	.5634	+1408	+9.4685	9.904		
29	40 Arietis	6	+2	-67	10 0.5	-4 6 56	-0.6231	.5635	+1278	+9.4833	9.989		
29	π Arietis	5½	+55	-12	10 21.7	-3 46 30	+0.2839	.5635	+1273	+9.4634	9.908		
29	ρ^2 Arietis	6	+21	-43	13 14.4	-0 59 44	-0.2850	.5635	+1222	+9.4848	9.978		
29	ρ^3 Arietis	6	+41	-23	13 30.3	-0 44 26	+0.0627	.5634	+1216	+9.4776	9.996		
29	53 Arietis	6	+90	+17	18 24.5	+3 59 36	+0.7729	.5634	+1129	+9.4746	9.998		
29	54 Arietis	6½	+29	-34	18 47.9	+4 22 9	-0.1524	.5634	+1122	+9.4963	9.975		
29	δ Arietis	4½	-22	-71	20 13.7	+5 45 1	-0.9870	.5634	+1098	+9.5173	9.951		
30	13 Tauri	6½	+55	-8	9 52.5	-5 4 32	+0.2813	.5626	+0844	+9.5184	9.950		
30	ω^1 Tauri	6	+90	+53	21 50.4	+6 28 32	+1.1760	.5618	+0614	+9.5180	9.950		
Oct. 1	ω^2 Tauri	5½	+57	-3	1 26.9	+9 57 32	+0.3193	.5608	+0544	+9.5391	9.923		
1	53 Tauri	6½	+23	-34	2 24.0	+10 52 44	-0.2426	.5608	+0524	+9.5507	9.907		
1	56 Tauri	6½	-18	-69	2 27.9	+10 56 27	-0.9191	.5607	+0524	+9.5630	9.889		
1	ϵ Tauri	5	+25	-20	22 2.9	+5 51 18	-0.2175	.5569	+0142	+9.5619	9.600		
2	ζ Tauri	5½	+90	+47	0 13.6	+7 57 36	+1.0651	.5562	+0100	+9.5389	9.923		
2	105 Tauri	6	+18	-35	0 14.6	+7 58 28	-0.3331	.5562	+0100	+9.5645	9.686		
2	η Tauri	6	-8	-68	5 24.0	-11 2 30	-0.7776	.5551	-0001	+9.5726	9.673		
2	θ Tauri	6	0	-59	9 13.7	-7 20 36	-0.6457	.5540	-0073	+9.5701	9.677		
2	B.A.C. 1733	6½	+90	+35	12 1.4	-4 38 30	+0.9028	.5532	-0126	+9.5417	9.920		
2	ι Tauri	3½	+45	-9	13 50.8	-2 52 49	+0.1311	.5527	-0162	+9.5554	9.900		
2	B.A.C. 1835	6½	+55	-2	18 48.2	+1 54 41	+0.2885	.5513	-0254	+9.5307	9.907		
2	χ^1 Orionis	5	+90	+29	21 37.2	+4 38 5	+0.8345	.5506	-0308	+9.5392	9.923		
2	χ^2 Orionis	5	+90	+26	2 2.9	+8 55 3	+0.8017	.5489	-0387	+9.5669	9.926		
3	68 Orionis	6	+90	+38	5 50.9	-11 24 29	+0.0045	.5478	-0457	+9.5302	9.935		
3	15 Geminor.	6	+6	-65	13 14.4	-4 15 29	-0.5483	.5455	-0586	+9.5518	9.905		
3	16 Geminor.	6	+24	-34	13 19.7	-4 10 24	-0.2278	.5454	-0587	+9.5458	9.914		
3	ν Geminor.	4	+40	-18	13 48.9	-3 42 5	+0.0507	.5451	-0597	+9.5401	9.922		
4	B.A.C. 2432	6½	+30	-33	15 55.9	-2 25 9	-0.1276	.5362	-1019	+9.5022	9.969		
5	ζ Geminor.	6	-15	-50	0 0.9	+5 24 48	-0.3923	.5333	-1137	+9.4896	9.982		
5	1 Cancri	6	+78	+4	8 46.9	-10 5 25	+0.5824	.5305	-1259	+9.4443	9.925		
5	5 Cancri	6	+12	-66	11 1.4	-7 55 5	-0.4534	.5299	-1287	+9.4617	9.910		
6	29 Cancri	6	+41	-27	0 47.3	+5 25 50	+0.0568	.5261	-1459	+9.4032	9.956		
6	B.A.C. 2872	6½	+90	+8	3 25.6	+7 59 22	+0.7037	.5257	-1489	+9.8751	9.674		
6	A ¹ Cancri	6	+77	0	8 16.5	-11 18 21	+0.5808	.5246	-1543	+9.3575	9.884		
6	A ² Cancri	6	+90	+19	10 12.4	-9 25 55	+0.8907	.5242	-1563	+9.3390	9.894		
6	60 Cancri	6	+88	+4	14 50.5	-4 56 5	+0.6742	.5236	-1610	+9.3230	9.902		
6	α Cancri	4	+49	-22	16 9.3	-3 39 38	+0.1993	.5231	-1624	+9.3313	9.898		
6	κ Cancri	5	+90	+5	20 58.4	+1 0 59	+0.6945	.5219	-1671	+9.2800	9.916		
6	B.A.C. 3122	6½	+11	-62	22 0.4	+2 1 7	-0.4750	.5220	-1681	+9.3220	9.902		
7	ω Leonis	6	+75	-4	7 45.8	+11 29 20	+0.5646	.5206	-1767	+9.2241	9.938		
7	λ Leonis	6	+11	-65	9 35.1	-10 44 36	-0.4918	.5205	-1782	+9.2530	9.929		
8	14 Sextantis	6	+75	-5	3 52.3	+7 0 36	+0.5640	.5198	-1908	+9.0387	9.874		
8	16 Sextantis	6	+21	-53	5 9.0	+8 15 2	-0.2066	.5198	-1914	+9.0758	9.689		
8	34 Sextantis	6	-16	-96	22 39.0	+1 14 27	-0.9408	.5212	-1996	+8.8743	9.828		
8	36 Sextantis	6	+36	-38	23 58.6	+2 31 43	-0.0197	.5214	-1999	+8.7474	9.893		
9	B.A.C. 3726	6	+90	+8	3 40.1	+6 6 44	+0.8218	.5219	-2019	+8.4848	9.898		
9	55 Leonis	6	+90	+5	5 28.3	+7 51 49	+0.7691	.5223	-2015	+8.4071	9.909		
9	ρ^2 Leonis	6	+90	+3	9 35.6	+11 51 49	+0.7288	.5231	-2025	+8.1066	9.0000		
9	ρ^3 Leonis	5	+23	-53	14 50.6	-7 2 26	-0.2709	.5241	-2033	+8.0639	9.0000		
9	ϵ Leonis	5	+88	+32	23 21.7	+1 13 28	+1.1516	0.5263	-2038	+8.5944	9.9997		

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Oct. 13	B.A.C. 4896	6	+26	-38	22 26.1	- 2 47 7	-0.0117	0.5731	-.1266	-9.4714	9.9801
14	1 st Libræ	4½	+72	+28	7 14.0	+ 5 41 46	+1.0651	.5776	-.1113	-9.5186	.9750
14	2 nd Libræ	6½	+72	+13	7 42.2	+ 6 8 55	+0.8614	.5776	-.1103	-9.5154	.9754
14	28 Libræ	6	-33	-90	10 55.8	+ 9 15 24	-1.0018	.5794	-.1045	-9.4819	.9791
14	B.A.C. 5109	6½	+30	-31	15 49.1	-10 2 7	+0.1049	.5816	-.0948	-9.5170	.9751
14	41 Libræ	6	- 4	-71	18 26.8	- 7 30 16	-0.5028	.5829	-.0897	-9.5092	.9761
14	α Libræ	5	+11	-50	19 42.7	- 6 17 12	-0.2172	.5834	-.0871	-9.5177	.9751
15	λ Libræ	6	+18	-41	0 24.8	- 1 45 35	-0.0660	.5855	-.0774	-9.5289	.9737
15	B.A.C. 5281	6	+63	- 1	2 19.0	+ 0 4 16	+0.6408	.5863	-.0736	-9.5460	.9714
15	ρ ¹ Scorpii	2	-21	-90	5 23.9	+ 3 2 12	-0.7623	.5872	-.0668	-9.5220	.9745
15	ρ ² Scorpii	5½	-21	-90	5 24.0	+ 3 2 18	-0.7654	.5872	-.0668	-9.5219	.9746
15	ω ¹ Scorpii	4½	+26	-32	5 56.5	+ 3 33 36	+0.0932	.5872	-.0660	-9.5401	.9722
15	ω ² Scorpii	4½	+37	-21	6 10.7	+ 3 47 17	+0.2838	.5875	-.0654	-9.5442	.9716
15	ν ¹ Scorpii	7	-71	-90	8 5.0	+ 5 37 11	-1.2794	.5882	-.0613	-9.5147	.9754
15	ν ² Scorpii	4	-66	-90	8 5.4	+ 5 37 37	-1.2697	.5883	-.0612	-9.5148	.9754
15	B.A.C. 5395	6	+67	+ 2	8 44.5	+ 6 15 11	+0.6908	.5883	-.0598	-9.5553	.9700
15	ψ Ophiuchi	5	-32	-90	13 0.7	+10 21 40	-0.9147	.5898	-.0505	-9.5280	.9738
15	ω Ophiuchi	5	+45	-13	16 14.2	-10 32 16	+0.4204	.5909	-.0434	-9.5576	.9697
16	B.A.C. 5663	6½	-32	-90	0 51.3	- 2 15 3	-0.8680	.5925	-.0236	-9.5379	.9725
16	B.A.C. 5758	6	+31	-23	5 57.6	+ 2 39 22	+0.2539	.5932	-.0118	-9.5616	.9691
16	ξ Ophiuchi	5	+ 5	-49	11 53.4	+ 8 21 24	-0.1922	.5938	+0.0020	-9.5536	.9702
16	B.A.C. 5866	6	+25	-27	13 22.5	+ 9 47 4	+0.1687	.5939	+0.0054	-9.5604	.9692
16	B.A.C. 5954	6	+68	+ 7	18 59.3	- 8 49 15	+0.7625	.5940	+0.0184	-9.5703	.9677
16	58 Ophiuchi	5	+55	- 4	20 52.4	- 7 0 35	+0.5828	.5942	+0.0230	-9.5662	.9683
17	B.A.C. 6081	6½	-10	-73	3 32.0	- 0 36 29	-0.5219	.5938	+0.0385	-9.5408	.9721
17	B.A.C. 6098	6	+15	-41	4 34.3	+ 0 23 25	-0.0662	.5937	+0.0409	-9.5490	.9709
17	μ ¹ Sagittarii	4	+50	- 9	9 2.1	+ 4 40 47	+0.5017	.5929	+0.0510	-9.5561	.9699
17	14 Sagittarii	6	+68	+42	9 13.3	+ 4 51 35	+1.1776	.5929	+0.0511	-9.5688	.9679
17	15 Sagittarii	5	+30	-26	9 37.5	+ 5 14 49	+0.2024	.5929	+0.0525	-9.5497	.9708
17	16 Sagittarii	6	+12	-46	9 38.2	+ 5 15 27	-0.1444	.5929	+0.0525	-9.5428	.9718
17	21 Sagittarii	5	+36	-21	13 42.3	+ 9 10 7	+0.2766	.5926	+0.0616	-9.5466	.9713
17	B.A.C. 6292	6	-56	-90	16 9.3	+11 31 28	-1.2117	.5918	+0.0670	-9.5125	.9757
17	29 Sagittarii	6	+70	+13	23 31.9	- 5 23 0	+0.8521	.5902	+0.0932	-9.5439	.9716
18	B.A.C. 6536	6½	+58	- 6	7 7.8	+ 1 55 27	+0.5529	.5880	+0.0890	-9.5234	.9743
18	d Sagittarii	5	+66	- 1	10 58.1	+ 5 36 58	+0.6350	.5868	+0.1069	-9.5169	.9751
18	q ¹ Sagittarii	4	+10	-55	12 39.1	+ 7 14 7	-0.2892	.5863	+0.1103	-9.4922	.9780
18	q ² Sagittarii	5½	+35	-27	12 42.3	+ 7 17 11	+0.1705	.5863	+0.1104	-9.5027	.9768
18	B.A.C. 6658	6	+59	- 7	15 16.5	+ 9 45 39	+0.5451	.5855	+0.1153	-9.5044	.9766
18	e ¹ Sagittarii	6	-22	-90	20 32.6	- 9 10 14	-0.8776	.5836	+0.1254	-9.4559	.9815
18	e ² Sagittarii	5	-27	-90	21 17.5	- 8 26 57	-0.9473	.5833	+0.1267	-9.4517	.9819
19	g Sagittarii	5½	- 9	-90	3 44.5	- 2 14 27	-0.6904	.5809	+0.1384	-9.4363	.9832
19	B.A.C. 6992	6½	+34	-33	13 22.2	+ 7 1 59	+0.0729	.5773	+0.1542	-9.4189	.9845
19	β Capricor.	3	+35	-32	13 28.2	+ 7 7 46	+0.0859	.5772	+0.1544	-9.4188	.9845
20	B.A.C. 7221	6½	+31	-38	2 12.5	- 4 35 41	-0.0173	.5724	+0.1726	-9.3536	.9886
20	B.A.C. 7242	6	-12	-90	3 15.9	- 3 34 35	-0.8058	.5716	+0.1739	-9.3208	.9903
20	8 Aquarii	6	+77	+41	6 11.8	- 0 44 56	+1.2187	.5710	+0.1777	-9.3705	.9877
20	ν Aquarii	4½	+51	-21	10 25.7	+ 3 19 52	+0.3050	.5694	+0.1828	-9.3150	.9905
20	17 Aquarii	6	- 1	-83	16 18.7	+ 9 0 25	-0.6469	.5674	+0.1892	-9.2351	.9935
20	19 Aquarii	6	+33	-39	17 18.2	+ 9 57 46	-0.0261	.5670	+0.1901	-9.2535	.9929
20	ξ Aquarii	4½	-12	-90	22 51.4	- 8 40 41	-0.8416	.5653	+0.1955	-9.1676	.9952
21	c ¹ Capricor.	6	+81	+24	2 8.9	- 5 34 59	+1.0498	.5643	+0.1984	-9.2267	.9937
21	30 Aquarii	5½	+44	-30	10 14.9	+ 2 19 0	+0.1382	.5620	+0.2044	-9.0967	.9966
21	44 Aquarii	6	+54	-21	16 28.6	+ 8 19 54	+0.2961	.5604	+0.2082	-9.0237	.9976
21	51 Aquarii	6	+61	-15	19 38.4	+11 23 12	+0.4005	.5600	+0.2098	-8.9834	.9980
22	α Aquarii	5	+85	+28	1 49.7	- 6 38 14	+1.1117	0.5589	+0.2124	-8.9339	9.9984

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ .	At Washington Mean Time of Conjunction.						Log sin D	Log cos D
			North- ern.	South- ern.		H	Y	p'	q'				
					$^{\circ}$ h m	$^{\circ}$ h m s							
Oct. 22	3 Piscium	6	-29	-90	12 15.5	+ 3 26 21	-1.1125	0.5574	+2149	-7.9753	0.0000		
22	B.A.C. 8152	6½	+90	+23	22 42.8	-10 27 31	+1.0481	.5564	+2150	-7.8984	.0000		
23	π Piscium	4½	+61	-16	0 16.5	- 8 56 56	+0.3986	.5564	+2150	+7.9530	.0000		
23	9 Piscium	6	+75	- 6	0 25.2	- 8 48 32	+0.5689	.5565	+2149	+7.8190	.0000		
23	15 Piscium	6½	+90	+36	4 11.8	- 5 9 34	+1.1907	.5564	+2144	+7.9932	0.0000		
23	16 Piscium	6	+67	-11	4 37.3	- 4 44 58	+0.4790	.5564	+2143	+8.3724	9.9999		
23	λ Piscium	5	+90	+62	7 12.8	- 2 14 43	+1.3568	.5564	+2137	+8.2566	.9999		
23	19 Piscium	6	+40	-34	9 12.1	- 0 19 26	+0.0448	.5564	+2130	+8.6788	.9995		
23	22 Piscium	6	+90	+33	11 44.9	+ 2 8 18	+1.1569	.5565	+2123	+8.5798	.9997		
24	45 Piscium	6	+10	-67	3 10.4	- 6 57 21	-0.4967	.5572	+2046	+9.0823	.9968		
24	51 Piscium	6½	+90	+13	6 14.1	- 3 59 54	+0.8800	.5576	+2026	+9.0340	.9975		
25	π Piscium	5	+90	+28	11 32.5	+ 0 18 53	+1.0418	.5613	+1738	+9.2977	.9913		
26	27 Arietis	6	-29	-73	11 31.4	- 0 31 49	-1.0864	.5647	+1395	+9.4685	.9804		
26	40 Arietis	6	- 2	-72	19 20.2	+ 7 0 42	-0.6353	.5655	+1268	+9.4834	.9789		
26	π Arietis	5½	+50	-16	19 41.3	+ 7 21 8	+0.2124	.5656	+1261	+9.4634	.9808		
26	ϕ^1 Arietis	6	+17	-48	22 33.6	+10 7 24	-0.3609	.5656	+1211	+9.4848	.9788		
26	ϕ^2 Arietis	6	+36	-27	22 53.8	+10 27 6	-0.0046	.5657	+1207	+9.4776	.9795		
27	53 Arietis	6	+90	+12	3 42.5	- 8 54 24	+0.6899	.5661	+1120	+9.4746	.9798		
27	δ Arietis	4½	-29	-71	5 31.2	- 7 9 34	-1.0720	.5662	+1089	+9.5173	.9751		
27	13 Tauri	6½	+48	-13	19 4.7	+ 5 55 37	+0.1779	.5662	+0838	+9.5184	.9750		
28	ω^1 Tauri	6	+90	+42	6 56.3	- 6 37 37	+1.0566	.5657	+0609	+9.5180	.9750		
28	ω^2 Tauri	5½	+49	- 9	10 30.6	- 3 10 46	+0.1984	.5652	+0537	+9.5391	.9723		
28	53 Tauri	6½	+17	-41	11 26.3	- 2 17 8	-0.3631	.5652	+0519	+9.5507	.9707		
28	56 Tauri	6½	-27	-69	11 31.1	- 2 12 24	-1.0375	.5651	+0517	+9.5630	.9689		
29	ϵ Tauri.	5	+17	-37	6 53.2	- 7 30 30	-0.3553	.5618	+0135	+9.5620	.9690		
29	ι Tauri	5½	+90	+36	9 2.4	- 5 25 44	+0.9202	.5611	+0094	+9.5389	.9723		
29	105 Tauri	6	+10	-45	9 3.3	- 5 24 52	-0.4726	.5610	+0093	+9.5645	.9686		
29	π Tauri	6	-18	-68	14 9.3	- 0 29 23	-0.9191	.5599	-0007	+9.5726	.9673		
29	ϕ Tauri	6	- 9	-68	17 56.3	+ 3 9 55	-0.7902	.5586	-0081	+9.5701	.9677		
29	B.A.C. 1733	6½	+90	+25	20 42.3	+ 5 50 12	+0.7504	.5580	-0135	+9.5417	.9720		
29	ϵ Tauri	3½	+36	-18	22 30.4	+ 7 34 40	-0.0197	.5574	-0170	+9.5554	.9700		
30	γ^1 Orionis	5	+90	+19	6 11.8	- 8 59 29	+0.6763	.5545	-0313	+9.5392	.9723		
30	γ^2 Orionis	6	+90	+64	6 27.4	- 8 44 24	+1.2439	.5545	-0320	+9.5282	.9738		
30	γ^3 Orionis	5	+90	+51	10 22.7	- 4 56 57	+1.1397	.5530	-0394	+9.5275	.9739		
30	γ^4 Orionis	5	+87	+16	10 34.8	- 4 45 17	+0.6413	.5530	-0396	+9.5669	.9726		
30	68 Orionis	6	+90	+27	14 20.5	- 1 7 3	+0.8314	.5517	-0462	+9.5302	.9735		
30	15 Geminor.	6	- 4	-69	2 39.9	+ 5 57 52	-0.2082	.5488	-0594	+9.5518	.9705		
30	16 Geminor.	6	+15	-44	21 45.1	+ 6 2 52	-0.3887	.5487	-0596	+9.5458	.9714		
30	ν Geminor.	4	+31	-27	22 14.1	+ 6 30 58	-0.1117	.5487	-0603	+9.5401	.9722		
Nov. 1	B.A.C. 2432	6½	+20	-42	0 10.7	+ 7 37 31	-0.2972	.5378	-1.022	+9.5022	.9769		
1	γ Geminor.	6	+ 6	-62	8 14.2	- 8 34 5	-0.5627	.5346	-1.139	+9.4896	.9789		
1	1 Cancri	6	+63	- 6	16 59.3	- 0 5 16	+0.4110	.5311	-1.258	+9.4443	.9685		
1	5 Cancri	6	+ 2	-68	19 13.6	+ 2 5 0	-0.6237	.5301	-1.226	+9.4617	.9810		
2	29 Cancri	6	+31	-37	9 0.4	- 8 33 14	-0.1116	.5255	-1.453	+9.4032	.9856		
2	B.A.C. 2872	6½	+73	- 2	11 39.1	- 5 59 20	+0.5363	.5247	-1.484	+9.3751	.9674		
2	Δ^1 Cancri	6	+63	- 9	16 31.1	- 1 16 0	+0.4148	.5232	-1.536	+9.3575	.9684		
2	Δ^2 Cancri	6	+90	+ 9	18 27.4	+ 0 36 53	+0.7368	.5228	-1.555	+9.3389	.9694		
2	60 Cancri	6	+71	- 5	23 6.9	+ 5 8 4	+0.5109	.5218	-1.601	+9.3229	.9902		
3	α Cancri	4	+39	-30	0 26.0	+ 6 24 55	+0.0357	.5211	-1.614	+9.3312	.9696		
3	π Cancri	5	+72	- 4	5 16.7	+11 7 5	+0.5337	.5200	-1.659	+9.2889	.9916		
3	B.A.C. 3122	6½	+ 2	-74	6 19.1	-11 52 24	-0.6369	.5198	-1.669	+9.3219	.9902		
3	ω Leonis	6	+63	-12	16 8.5	- 2 20 12	+0.4098	.5180	-1.751	+9.2241	.9938		
3	λ Leonis	6	+ 2	-77	17 58.5	- 0 33 24	-0.6476	.5177	-1.766	+9.2529	.9929		
4	B.A.C. 3438	6½	+90	+50	11 22.0	- 7 40 4	+1.2042	0.5165	-1.882	+8.9940	9.9979		

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.						
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D	
Nov. 4	14 Sextantis	6	+63	-13	12 25.0	h m s	h m s	+0.4246	0.5166	-1.888	+9.0385	9.9974
4	16 Sextantis	6	+13	-63	13 42.4	- 5 23 41	-0.4384	.5167	-1.894	+9.0757	.9969	
5	34 Sextantis	6	-25	-86	7 22.0	+11 45 22	-1.0688	.5177	-1.972	+8.8741	.9988	
5	36 Sextantis	6	+29	-45	8 42.3	-10 56 42	-0.1442	.5181	-1.977	+8.7472	.9993	
5	B.A.C. 3726	6	+89	+ 1	12 25.8	- 7 19 42	+0.7026	.5184	-1.988	+8.4845	.9998	
5	55 Leonis	6	+83	- 2	14 15.0	- 5 33 39	+0.6516	.5188	-1.993	+8.4069	9.9999	
5	p ¹ Leonis	6	+79	- 4	18 24.3	-1 31 38	+0.6153	.5196	-2.002	+8.1061	0.0000	
5	p ² Leonis	5	+17	-60	23 41.8	+ 3 36 39	-0.3808	.5211	-2.011	+8.0682	0.0000	
6	e Leonis	5	+88	+24	8 16.5	+11 56 8	+1.0527	.5236	-2.016	-8.5944	9.9967	
7	χ Virginis	5	+ 9	-68	18 52.7	- 2 30 52	-0.4909	.5301	-1.931	-9.1007	.9965	
7	B.A.C. 4259	6	+10	-66	18 56.5	- 2 27 5	-0.4636	.5391	-1.930	-9.1029	.9965	
7	28 Virginis	6	-47	-90	20 11.4	-1 14 33	-1.2685	.5399	-1.919	-9.0701	.9970	
8	B.A.C. 4312	6½	+81	+12	0 43.5	+ 3 8 54	+0.8802	.5425	-1.897	-9.2220	.9939	
8	ψ Virginis	5	+22	-51	2 9.6	+ 4 32 12	-0.2350	.5435	-1.887	-9.1845	.9949	
8	g Virginis	6	+26	-46	8 35.5	+10 45 40	-0.1543	.5475	-1.841	-9.2401	.9934	
8	50 Virginis	6	- 7	-90	9 28.4	+11 36 53	-0.7469	.5479	-1.834	-9.2221	.9939	
8	58 Virginis	6	-38	-90	13 5.5	-8 53 5	-1.1652	.5502	-1.804	-9.2321	.9936	
8	α Virginis	1	-37	-90	16 41.2	- 5 24 35	-1.1543	.5527	-1.772	-9.2585	.9927	
8	i Virginis	5	+53	-18	17 23.3	-4 43 53	+0.3448	.5531	-1.765	-9.3178	.9904	
8	B.A.C. 4531	6	+47	-24	21 2.7	-1 11 46	+0.2468	.5555	-1.730	-9.3357	.9896	
11	ω Ophiuchi	5	+48	-10	23 40.0	- 1 18 46	+0.4733	.5995	-0.0432	-9.5776	.9697	
12	B.A.C. 5663	6½	-28	-90	8 3.6	+ 6 44 51	-0.8029	.6016	-0.0233	-9.5379	.9725	
12	B.A.C. 5758	6	+34	-20	13 1.8	+11 31 14	+0.3092	.6024	-0.0115	-9.5616	.9691	
12	ξ Ophiuchi	5	+ 8	-45	18 48.2	-6 56 13	-0.1278	.6030	+0.0021	-9.5536	.9702	
12	B.A.C. 5866	6	+29	-24	20 15.0	- 5 32 53	+0.2295	.6030	+0.0660	-9.5604	.9692	
13	B.A.C. 5954	6	+68	+11	1 43.1	- 0 17 56	+0.8202	.6030	+0.0196	-9.5703	.9677	
13	58 Ophiuchi	5	+60	0	3 33.2	+ 1 27 47	+0.6434	.6028	+0.0240	-9.5662	.9683	
13	B.A.C. 6081	6½	- 5	-67	10 2.8	+7 41 49	-0.4453	.6023	+0.0395	-9.5408	.9721	
13	B.A.C. 6098	6	+19	-37	11 3.6	+ 8 40 9	+0.0059	.6020	+0.0417	-9.5490	.9709	
13	μ ¹ Sagittarii	4	+56	- 5	15 24.8	-11 9 2	+0.5702	.6015	+0.0524	-9.5561	.9699	
13	14 Sagittarii	6	+68	+52	15 35.7	-10 58 33	+1.2388	.6015	+0.0528	-9.5688	.9679	
13	15 Sagittarii	5	+35	-22	15 59.4	-10 35 50	+0.2731	.6015	+0.0536	-9.5497	.9708	
13	16 Sagittarii	6	+16	-40	16 0.0	-10 35 14	-0.0690	.6015	+0.0535	-9.5428	.9718	
13	21 Sagittarii	5	+41	-17	19 58.4	-6 46 16	+0.3494	.6003	+0.0629	-9.5466	.9713	
13	B.A.C. 6292	6	-47	-90	22 22.1	- 4 28 17	-1.1225	.5997	+0.0686	-9.5125	.9757	
14	29 Sagittarii	6	+70	+18	5 35.1	+ 2 27 38	+0.9234	.5973	+0.0845	-9.5439	.9716	
14	B.A.C. 6536	6½	+65	- 2	13 1.9	+9 36 56	+0.6301	.5944	+0.1005	-9.5235	.9743	
14	d Sagittarii	5	+71	+ 3	16 48.0	-10 45 44	+0.7132	.5931	+0.1083	-9.5168	.9751	
14	e ¹ Sagittarii	4	+14	-49	18 27.2	- 9 10 22	-0.2032	.5921	+0.1117	-9.4922	.9780	
14	e ² Sagittarii	5½	+40	-22	18 30.3	- 9 7 21	+0.2619	.5921	+0.1118	-9.5027	.9768	
14	B.A.C. 6658	6	+66	- 2	21 2.1	- 6 41 25	+0.6256	.5910	+0.1166	-9.5044	.9766	
15	e ¹ Sagittarii	6	-17	-90	2 13.2	-1 42 13	-0.7861	.5884	+0.1263	-9.4559	.9815	
15	e ² Sagittarii	5	-21	-90	2 57.5	-0 59 35	-0.8553	.5880	+0.1278	-9.4517	.9819	
15	g Sagittarii	5½	- 5	-81	9 19.3	+ 5 7 48	-0.5995	.5849	+0.1392	-9.4363	.9832	
15	B.A.C. 6992	6½	+39	-28	18 51.2	- 9 41 40	+0.1602	.5800	+0.1549	-9.4189	.9845	
15	β Capricor.	3	+40	-27	18 57.2	- 9 35 54	+0.1732	.5798	+0.1550	-9.4188	.9845	
16	B.A.C. 7221	6½	+36	-33	7 37.0	+ 2 36 12	+0.0705	.5733	+0.1721	-9.3576	.9866	
16	B.A.C. 7242	6	- 7	-90	8 40.2	+ 3 37 4	-0.7163	.5728	+0.1742	-9.3208	.9903	
16	8 Aquarii	6	+77	+55	11 35.8	+6 26 22	+1.3047	.5712	+0.1778	-9.3716	.9877	
16	ν Aquarii	4½	+56	-16	15 49.6	+10 31 4	+0.3921	.5691	+0.1826	-9.3150	.9905	
16	17 Aquarii	6	+ 3	-75	21 43.1	- 7 47 54	-0.5610	.5662	+0.1887	-9.2351	.9935	
16	19 Aquarii	6	+37	-34	22 42.7	- 6 50 24	+0.0600	.5660	+0.1897	-9.2535	.9929	
17	ξ Aquarii	4½	- 7	-90	4 17.3	-1 27 29	-0.7579	.5635	+0.1946	-9.1677	.9952	
17	c ¹ Capricor.	6	+81	+31	7 30.8	+1 39 18	+1.1363	.5621	+0.1972	-9.2267	.9937	
17	30 Aquarii	5½	+48	-25	15 45.8	+ 9 37 14	+0.2208	0.5590	+0.2030	-9.0967	9.9966	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Nov. 17	44 Aquarii	6	+59	-17	22 3.6	- 8 17 47	+0.3776	0.5565	+2064	-9.0237	9.9976
	51 Aquarii	6	+67	-11	1 15.7	- 5 12 11	+0.4899	.5558	+2079	-8.9834	.9980
18	α Aquarii	5	+85	+36	7 32.0	+ 0 51 29	+1.1945	.5540	+2101	-8.9339	9.9984
18	3 Piscium	6	-24	-90	18 8.0	+11 6 17	-1.0486	.5517	+2122	-7.9755	0.0000
19	B.A.C. 8152	6½	+90	+30	4 47.2	- 2 35 40	+1.1231	.5501	+2120	-7.8987	.0000
19	π Piscium	4½	+66	-12	6 22.8	- 1 3 12	+0.4673	.5498	+2118	+7.9460	.0000
19	9 Piscium	6	+82	- 3	6 31.7	- 0 54 35	+0.6382	.5498	+2118	+7.8197	0.0000
19	16 Piscium	6	+73	- 8	10 48.9	+ 3 14 8	+0.5453	.5497	+2111	+8.3726	9.9989
19	19 Piscium	6	+43	-31	15 29.6	+ 7 45 37	+0.1050	.5494	+2099	+8.6788	.9986
19	22 Piscium	6	+90	+40	18 5.8	+10 16 40	+1.2257	.5492	+2090	+8.5799	.9997
20	45 Piscium	6	+13	-64	9 52.3	+ 1 32 6	-0.4523	.5500	+2013	+9.0823	.9968
20	51 Piscium	6½	+90	+17	13 0.2	+ 4 33 45	+0.9358	.5500	+1993	+9.0340	.9975
21	π Piscium	5	+90	+31	18 58.0	+ 9 32 2	+1.0750	.5549	+1712	+9.2716	.9913
21	104 Piscium	6½	-22	-78	19 55.5	+10 27 35	-1.0134	.5551	+1701	+9.3712	.9877
22	27 Arietis	6	-29	-74	19 23.7	+ 9 8 13	-1.0789	.5601	+1377	+9.4684	.9804
23	40 Arietis	6	- 2	-71	3 19.4	- 7 12 16	-0.6802	.5616	+1255	+9.4833	.9789
23	π Arietis	5½	+51	-15	3 40.9	- 6 51 34	+0.2246	.5617	+1246	+9.4633	.9808
23	ρ ¹ Arietis	6	+19	-45	6 54.2	- 3 44 52	-0.3170	.5622	+1195	+9.4848	.9788
23	ρ ² Arietis	6	+37	-26	6 51.6	- 3 47 23	-0.0043	.5622	+1194	+9.4776	.9795
23	53 Arietis	6	+90	+13	11 48.4	+ 0 59 14	+0.7013	.5631	+1110	+9.4746	.9798
23	54 Arietis	6½	+22	-41	12 11.9	+ 1 21 55	-0.2309	.5631	+1104	+9.4963	.9775
23	δ Arietis	4½	-29	-72	13 38.3	+ 2 45 19	-1.0725	.5633	+1079	+9.5173	.9751
24	ω ¹ Tauri	6	+90	+41	15 15.8	+ 3 29 41	+1.0556	.5651	+0605	+9.5180	.9750
24	ω ² Tauri	5½	+49	-10	18 51.1	+ 6 57 27	+0.1933	.5651	+0534	+9.5390	.9723
25	ι Tauri	5	+16	-38	15 15.7	+ 2 39 46	-0.3680	.5630	+0133	+9.5619	.9690
25	ι Tauri	5½	+90	+36	17 24.8	+ 4 44 24	+0.9097	.5627	+0089	+9.5389	.9723
25	105 Tauri	6	+10	-46	17 25.7	+ 4 45 16	-0.4855	.5627	+0089	+9.5645	.9686
25	η Tauri	6	-19	-60	22 31.2	+ 9 40 20	-0.9337	.5617	-0011	+9.5726	.9673
26	ο Tauri	6	-10	-69	2 17.8	-10 40 51	-0.8658	.5607	-0083	+9.5701	.9677
26	B.A.C. 1733	6½	+90	+24	5 3.2	- 8 1 4	+0.7360	.5600	-0136	+9.5417	.9720
26	ζ Tauri	3½	+35	-19	6 51.0	- 6 16 54	-0.0351	.5596	-0172	+9.5554	.9700
26	B.A.C. 1835	6½	+44	-11	11 44.2	- 1 33 41	+0.1178	.5580	-0266	+9.5507	.9717
26	χ ¹ Orionis	5	+89	+18	14 30.7	+ 1 7 12	+0.6598	.5572	-0318	+9.5302	.9723
26	χ ² Orionis	6	+90	+61	14 46.2	+ 1 22 14	+1.2274	.5572	-0323	+9.5222	.9738
26	χ ³ Orionis	5	+90	+49	18 40.5	+ 5 8 40	+1.1233	.5559	-0396	+9.5275	.9739
26	χ ⁴ Orionis	5	+84	+15	18 52.6	+ 5 20 18	+0.6243	.5559	-0399	+9.5669	.9726
26	68 Orionis	6	+90	+26	22 37.3	+ 8 57 30	+0.8136	.5549	-0468	+9.5302	.9735
27	15 Geminor.	6	- 5	-69	5 54.4	- 7 59 54	-0.7275	.5517	-0507	+9.5518	.9705
27	16 Geminor.	6	+14	-45	5 50.6	- 7 54 52	-0.4080	.5517	-0509	+9.5458	.9714
27	ν Geminor.	4	+30	-28	6 28.4	- 7 26 59	-0.1310	.5513	-0609	+9.5401	.9732
28	B.A.C. 2432	6½	+19	-44	8 16.7	- 6 28 46	-0.3166	.5403	-1028	+9.5622	.9769
28	f Geminor.	6	+ 4	-63	16 17.9	+ 1 17 21	-0.5820	.5360	-1144	+9.4806	.9782
29	1 Cancri	6	+62	- 7	1 1.0	+ 9 44 14	+0.3824	.5331	-1261	+9.4443	.9825
29	5 Cancri	6	+ 1	-69	3 15.0	+11 54 8	-0.6428	.5322	-1289	+9.4617	.9810
29	29 Cancri	6	+30	-38	17 0.4	+ 1 14 31	-0.1293	.5266	-1454	+9.4031	.9866
29	B.A.C. 2872	6½	+73	- 3	19 39.0	+ 3 48 20	+0.5201	.5257	-1485	+9.3750	.9874
30	A ¹ Cancri	6	+62	-10	0 31.1	+ 8 31 44	+0.3993	.5237	-1536	+9.3574	.9884
30	A ² Cancri	6	+90	+ 8	2 27.6	+10 24 47	+0.7201	.5231	-1555	+9.3389	.9884
30	60 Cancri	6	+69	- 5	7 7.5	- 9 3 30	+0.4975	.5214	-1600	+9.3229	.9882
30	α Cancri	4	+38	-31	8 26.9	- 7 46 28	+0.0206	.5211	-1613	+9.3312	.9898
30	π Cancri	5	+71	- 5	13 18.6	- 3 3 21	+0.5212	.5196	-1656	+9.2889	.9916
30	B.A.C. 3122	6½	+ 1	-75	14 21.1	- 2 2 36	-0.6529	.5192	-1665	+9.3219	.9912
Dec. 1	ω Leonis	6	+62	-13	0 13.5	+ 7 32 38	+0.3988	.5169	-1745	+9.2240	.9938
1	λ Leonis	6	+ 1	-78	2 4.3	+ 9 20 10	-0.6619	.5162	-1758	+9.2523	.9869
1	B.A.C. 3336	5½	+90	+49	9 39.6	- 7 17 32	+1.2776	0.5148	-1811	+9.1060	9.9964

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	P'	q'	Log sin D	Log cos D
Dec. 1	14 Sextantis	6	+63	-13	20 40.6	+ 3 24 34	+0.4184	0.5136	-.1874	+9.0385	9.9974
	16 Sextantis	6	+13	-63	21 58.9	+ 4 40 38	-0.4488	.5133	-.1881	+9.0757	.9969
	34 Sextantis	6	-26	-86	15 52.3	- 1 56 29	-1.0797	.5134	-.1953	+8.8740	.9988
	36 Sextantis	6	+29	-45	17 13.8	- 0 37 19	-0.1493	.5135	-.1957	+8.7471	.9993
2	B.A.C. 3726	6	+90	+ 1	21 0.7	+ 3 3 5	+0.7039	.5137	-.1968	+8.4842	.9998
2	55 Leonis	6	+83	- 2	22 51.6	+ 4 50 50	+0.6528	.5142	-.1972	+8.4064	9.9999
3	p ² Leonis	6	+79	- 4	3 5.0	+ 8 57 0	+0.6173	.5146	-.1981	+8.1052	0.0000
3	p ³ Leonis	5	+16	-60	8 28.0	- 9 49 20	-0.3842	.5156	-.1988	+8.0673	0.0000
3	e Leonis	5	+88	+24	17 11.8	- 1 20 40	+1.0610	.5174	-.1993	-8.5948	9.9997
5	χ Virginis	5	+ 9	-68	4 26.2	+ 8 50 40	-0.4883	.5331	-.1907	-9.1008	.9965
5	B.A.C. 4259	6	+11	-66	4 30.1	+ 8 54 27	-0.4610	.5331	-.1906	-9.1030	.9965
5	28 Virginis	6	-47	-90	5 46.3	+10 8 21	-1.2706	.5340	-.1901	-9.0702	.9970
5	B.A.C. 4312	6½	+81	-13	10 23.1	- 9 23 32	+0.8911	.5365	-.1875	-9.2220	.9939
5	ψ Virginis	5	+22	-50	11 50.5	- 7 58 48	-0.2306	.5374	-.1866	-9.1846	.9949
5	γ Virginis	6	+26	-46	18 22.7	- 1 39 6	-0.1490	.5419	-.1821	-9.2402	.9934
5	50 Virginis	6	- 7	-90	19 16.5	- 0 47 0	-0.7449	.5424	-.1816	-9.2222	.9939
5	58 Virginis	6	-37	-90	22 56.8	+ 2 46 17	-1.1649	.5435	-.1766	-9.2322	.9936
6	α Virginis	1	-37	-90	2 35.4	+ 6 17 46	-1.1529	.5475	-.1755	-9.2586	.9927
6	i Virginis	5	+54	-18	3 18.1	+ 6 59 4	+0.3526	.5479	-.1749	-9.3179	.9904
6	B.A.C. 4531	6	+47	-23	7 0.3	+10 33 59	+0.2541	.5509	-.1715	-9.3358	.9896
6	B.A.C. 4679	6½	+26	-42	20 33.8	- 0 19 58	-0.0916	.5612	-.1564	-9.3931	.9863
6	B.A.C. 4700	5½	+75	+12	23 23.5	+ 2 23 53	+0.8670	.5635	-.1528	-9.4312	.9836
7	B.A.C. 4896	6	+27	-37	17 2.6	+ 4 34 44	+0.0008	.5773	-.1268	-9.4714	.9801
8	l ¹ Libræ	4½	+71	+29	1 39.4	+ 3 43 3	+1.0735	.5841	-.1115	-9.5186	.9750
8	l ² Libræ	6½	+71	+14	2 6.9	+ 4 9 30	+0.8734	.5842	-.1108	-9.5154	.9754
8	28 Libræ	6	-30	-90	5 15.7	+ 7 11 13	-0.9631	.5867	-.1050	-9.4819	.9791
8	B.A.C. 5109	6½	+31	-30	10 1.1	+11 45 44	+0.1320	.5901	-.0966	-9.5170	.9751
8	41 Libræ	6	- 2	-68	12 34.2	- 9 47 0	-0.4650	.5918	-.0902	-9.5432	.9761
8	α Libræ	5	+13	-48	13 47.8	- 8 36 15	-0.1828	.5928	-.0877	-9.5177	.9751
11	29 Sagittarii	6	+70	+15	14 8.4	-11 11 12	+0.8841	.6080	+0.0854	-9.5438	.9716
11	B.A.C. 6536	6½	+62	- 4	21 20.6	- 4 16 34	+0.5920	.6062	+0.1019	-9.5234	.9743
12	d Sagittarii	5	+68	+ 1	0 59.1	- 0 46 50	+0.6717	.6040	+0.1097	-9.5168	.9751
12	q ¹ Sagittarii	4	+13	-51	2 35.0	+ 0 45 13	-0.2314	.6032	+0.1133	-9.4122	.9780
12	q ² Sagittarii	5½	+38	-24	2 38.0	+ 0 48 8	+0.2266	.6031	+0.1134	-9.5427	.9768
12	B.A.C. 6658	6	+62	- 4	5 4.6	+ 3 8 55	+0.5833	.6020	+0.1183	-9.5444	.9766
12	e ¹ Sagittarii	6	-18	-90	10 5.2	+ 7 57 31	-0.8087	.5995	+0.1284	-9.4559	.9815
12	e ² Sagittarii	5	-22	-90	10 48.0	+ 8 38 39	-0.8770	.5992	+0.1290	-9.4517	.9819
12	g Sagittarii	5½	- 6	-84	16 56.9	- 9 26 59	-0.6280	.5976	+0.1415	-9.4363	.9832
13	B.A.C. 6992	6½	+36	-31	2 9.5	- 0 35 40	+0.1159	.5907	+0.1570	-9.4189	.9845
13	β Capricor.	3	+37	-30	2 15.3	- 0 30 10	+0.1287	.5907	+0.1574	-9.4188	.9845
13	B.A.C. 7221	6½	+33	-36	14 30.5	+11 17 13	+0.0222	.5833	+0.1755	-9.3536	.9886
13	B.A.C. 7242	6	- 9	-90	15 31.7	-11 43 53	-0.7541	.5826	+0.1768	-9.3208	.9803
13	8 Aquarii	6	+77	+43	18 21.8	- 9 0 4	+1.2374	.5810	+0.1842	-9.3705	.9877
13	γ Aquarii	4½	+53	-19	22 27.8	- 5 3 7	+0.3359	.5784	+0.1853	-9.3150	.9905
14	17 Aquarii	6	+ 1	-79	4 11.1	+ 0 27 36	-0.6066	.5753	+0.1870	-9.2352	.9935
14	19 Aquarii	6	+34	-37	5 9.1	+ 1 23 29	+0.0063	.5744	+0.1920	-9.2535	.9929
14	ε Aquarii	4½	-10	-90	10 34.5	+ 6 37 12	-0.8035	.5715	+0.1971	-9.1677	.9952
14	e ¹ Capricor.	6	+81	+25	13 43.0	+ 9 39 0	+1.0664	.5616	+0.1996	-9.2268	.9837
14	30 Aquarii	5½	+45	-28	21 46.0	- 6 35 1	+0.1594	.5655	+0.2051	-9.0168	.9866
15	44 Aquarii	6	+55	-20	3 55.6	- 0 38 19	+0.3129	.5625	+0.2179	-9.0237	.9876
15	51 Aquarii	6	+62	-14	7 4.0	+ 2 23 33	+0.4237	.5612	+0.2066	-8.9834	.9980
15	α Aquarii	5	+85	+29	13 13.5	+ 8 20 24	+1.1215	.5586	+0.2115	-8.9339	9.9884
15	3 Piscium	6	-28	-90	23 40.2	- 5 34 8	-1.1064	.5548	+0.2132	-7.9760	0.0000
16	B.A.C. 8152	6½	+90	+24	10 12.9	+ 4 37 24	+1.0512	.5518	+0.2127	-7.8992	.0000
16	α Piscium	4½	+61	-16	11 47.8	+ 6 9 6	+0.3989	0.5514	+0.2124	+7.9523	0.0000

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of 6.	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	I	p'	q'	Log sin D	Log cos D
					^h ^m	^h ^m ^s					
Dec. 16	9 Piscium	6	+75	-6	11 56.6	+ 6 17 38	+0.5695	0.5513	+2123	+7.7780	0.0000
16	15 Piscium	6½	+90	+36	15 46.4	+ 9 59 46	+1.1921	.5504	+2114	+7.9926	0.0000
16	16 Piscium	6	+67	-11	16 12.1	+10 24 42	+0.4771	.5504	+2114	+8.3721	9.9999
16	2 Piscium	5	+90	+64	18 50.2	-11 2 26	+1.3586	.5499	+2108	+8.2563	.9999
16	19 Piscium	6	+39	-35	20 51.6	- 9 5 4	+0.0384	.5495	+2100	+8.6787	.9995
16	22 Piscium	6	+90	+33	23 27.3	- 6 34 29	+1.1561	.5493	+2090	+8.7797	.9997
17	45 Piscium	6	+9	-68	15 14.4	+ 8 41 30	-0.5174	.5475	+2009	+9.0822	.9968
17	51 Piscium	6½	+90	+13	18 23.0	+11 43 56	+0.8710	.5478	+1985	+9.0339	.9975
19	π Piscium	6	+90	+27	0 37.6	- 7 1 9	+1.0226	.5490	+1700	+9.2978	.9913
19	104 Piscium	6½	-27	-77	1 35.8	- 6 4 44	-1.0737	.5502	+1688	+9.3712	.9877
20	27 Arietis	6	-33	-73	1 25.3	- 7 2 41	-1.1298	.5542	+1369	+9.4685	.9804
20	40 Arietis	6	-4	-72	9 29.1	+ 0 44 50	-0.7335	.5558	+1246	+9.4834	.9799
20	π Arietis	5½	+48	-17	9 50.8	+ 1 5 53	+0.1860	.5559	+1240	+9.4634	.9808
20	ρ ² Arietis	6	+15	-50	12 48.5	+ 3 57 31	-0.3945	.5564	+1192	+9.4848	.9788
20	ρ ² Arietis	6	+35	-29	13 4.7	+ 4 13 12	-0.0426	.5565	+1190	+9.4776	.9796
20	53 Arietis	6	+89	+11	18 6.6	+ 9 4 52	+0.6707	.5572	+1107	+9.4746	.9798
20	54 Arietis	6½	+22	-41	18 39.4	+ 9 27 54	-0.3837	.5574	+1098	+9.4 63	.9775
20	δ Arietis	4½	-33	-71	19 58.3	+10 52 48	-1.1130	.5574	+1074	+9.5173	.9751
21	13 Tauri	6½	+46	-15	9 53.2	+ 0 19 22	+0.1559	.5594	+0831	+9.5184	.9750
21	ω Tauri	6	+90	+41	22 0.1	-11 58 30	+1.0471	.5604	+0607	+9.5180	.9750
22	ω ² Tauri	5½	+48	-10	1 38.3	- 8 27 41	+0.1823	.5607	+0538	+9.5390	.9723
22	53 Tauri	6½	+15	-43	2 36.0	- 7 32 2	-0.3837	.5607	+0518	+9.5506	.9707
22	56 Tauri	6½	-31	-69	2 39.9	- 7 28 15	-1.0644	.5607	+0517	+9.5628	.9689
22	ι Tauri	5	+16	-38	22 17.7	+11 29 24	-0.3651	.5600	+0142	+9.5619	.9690
23	ι Tauri	5½	+90	+36	0 28.1	-10 24 40	-0.9202	.5599	+0097	+9.5389	.9723
23	105 Tauri	6	+10	-46	9 29.0	-10 23 49	-0.4816	.5599	+0097	+9.5645	.9686
23	π Tauri	6	-19	-68	5 37.3	- 5 25 55	-0.9270	.5594	-0002	+9.5726	.9673
23	ο Tauri	6	-9	-68	9 25.8	- 1 45 13	-0.7950	.5587	-0077	+9.5701	.9677
23	B.A.C. 1733	6½	+90	+26	12 12.5	+ 0 55 51	+0.7561	.5582	-0127	+9.5417	.9720
23	ζ Tauri	3½	+36	-17	14 1.1	+ 2 40 47	-0.0164	.5581	-0161	+9.5554	.9700
23	B.A.C. 1835	6½	+46	-10	18 56.2	+ 7 25 58	+0.1417	.5568	-0254	+9.5507	.9707
23	χ ¹ Orionis	5	+90	+20	21 43.6	+10 7 49	+0.6885	.5563	-0308	+9.5382	.9723
23	χ ² Orionis	6	+90	+66	21 59.3	+10 22 58	+1.2583	.5560	-0312	+9.5282	.9738
24	χ ³ Orionis	5	+90	+53	1 54.7	- 9 49 29	+1.1569	.5550	-0384	+9.5275	.9739
24	χ ⁴ Orionis	5	+89	+17	2 6.8	- 9 37 48	+0.6563	.5549	-0388	+9.5669	.9726
24	68 Orionis	6	+90	+28	5 52.4	- 5 59 42	+0.8503	.5541	-0458	+9.5302	.9735
24	15 Geminor.	6	-2	-67	13 10.9	+ 1 4 17	-0.6889	.5518	-0588	+9.5518	.9705
24	16 Geminor.	6	+16	-42	13 16.1	+ 1 9 18	-0.3683	.5518	-0589	+9.5458	.9714
24	ν Geminor.	4	+32	-26	13 45.1	+ 1 37 21	-0.0899	.5516	-0599	+9.5401	.9722
25	B.A.C. 2432	6½	+23	-40	15 34.0	+ 2 36 8	-0.2501	.5422	-1022	+9.5022	.9769
25	ζ Geminor.	6	+9	-57	23 34.3	+10 21 20	-0.5069	.5382	-1139	+9.4895	.9782
26	1 Cancri	6	+68	-2	8 16.2	- 5 12 57	+0.4775	.5352	-1257	+9.4443	.9825
26	5 Cancri	6	+6	-63	10 29.9	- 3 3 24	-0.5575	.5348	-1287	+9.4617	.9810
27	29 Cancri	6	+35	-32	0 12.9	+10 14 40	-0.0292	.5287	-1451	+9.4032	.9856
27	B.A.C. 2872	6½	+82	+3	2 51.2	-11 11 52	+0.6238	.5278	-1482	+9.3751	.9874
27	A ¹ Cancri	6	+71	-4	7 42.6	- 6 29 10	+0.5076	.5258	-1533	+9.3574	.9884
27	A ² Cancri	6	+90	+15	9 38.8	- 4 36 25	+0.8310	.5250	-1552	+9.3380	.9884
27	6 Cancri	6	+80	+1	14 18.2	- 0 5 17	+0.6120	.5234	-1597	+9.3229	.9902
27	α Cancri	4	+45	-25	15 37.3	+ 1 11 35	+0.1356	.5234	-1611	+9.3312	.9882
27	π Cancri	5	+83	+2	20 28.6	+ 5 54 17	+0.6419	.5213	-1654	+9.2889	.9916
27	B.A.C. 3132	6½	+8	-66	21 31.2	+ 6 55 2	-0.5342	.5208	-1662	+9.3219	.9902
28	ω Leonis	6	+72	-6	7 23.3	- 7 30 0	+0.5292	.5178	-1742	+9.2240	.9938
28	λ Leonis	6	+8	-68	9 14.1	- 5 42 22	-0.5337	.5175	-1753	+9.2528	.9929
28	14 Sextantis	6	+70	-8	3 53.3	-11 35 10	+0.5095	.5133	-1867	+9.0383	.9874
29	16 Sextantis	6	+20	-54	5 11.9	-10 18 47	-0.3055	.5131	-1874	+9.0755	.9969

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1863.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Dec. 29	34 Sextantis	6	-15	-86	^{h m} 23 13.0	^{h m s} + 7 11 47	-0.9298	0.5116	-.1942	+8.8738	9.9988
30	36 Sextantis	6	+38	-36	0 35.3	+ 8 31 44	+0.0071	.5116	-.1945	+8.7468	9.9993
30	B.A.C. 3726	6	+90	+11	4 24.5	-11 45 26	+0.8676	.5116	-.1954	+8.4838	9.9998
30	55 Leonis	6	+90	+ 8	6 16.8	- 9 56 22	+0.8174	.5117	-.1959	+8.4060	9.9999
30	p^s Leonis	6	+90	+ 6	10 33.2	- 5 47 12	+0.7838	.5120	-.1965	+8.0942	0.0000
30	p^s Leonis	5	+25	-50	16 0.5	- 0 29 9	-0.2238	.5124	-.1972	+8.0733	0.0000
31	e Leonis	5	+88	+41	0 52.5	+ 8 7 45	+1.2362	0.5138	-.1974	-8.5951	9.9997

NOTE. — B. A. C., British Association Catalogue.

OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT
WASHINGTON, D. C., DURING THE YEAR 1863.

Date.	Star's Name.	Magnitude.	IMMERSSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington		Angle from		
			Sidereal Time.	Mean Time.	North Point.	Vert.	Sidereal Time.	Mean Time.	North Point.	Vert.	
			h m	h m	°		h m	h m	°	h m	
Jan.	2 n Tauri	6	23 38	4 50	188	133	Star 3'.3	south of	♈'s limb.		
	5 5 Cancri	6	6 50	11 49	161	130	Star 0'.5	south of	♈'s limb.		
	6 α Cancri	4	12 51	17 46	221	273	13 53	18 47	85	137	
	12 85 Virginis	6	11 16	15 46	223	192	12 28	16 58	81	64	
	21 44 Aquarii	6	2 5	6 2	29	74	Star 0'.3	north of	♈'s limb.		
	26 27 Arietis	6	0 53	4 30	308	271	2 18	5 55	101	86	
	28 56 Tauri	6½	6 8	9 36	183	230	Star 3'.1	south of	♈'s limb.		
	28 α' Tauri	5½	9 31	12 59	357	52	Star 1'.1	north of	♈'s limb.		
	28 α' Tauri	6½	9 11	12 39	312	8	9 56	13 24	42	96	
	29 α Tauri	6	10 34	13 58	219	274	11 19	14 43	124	177	
Feb.	5 p' Leonis	6	12 40	15 36	282	311	13 36	16 32	15	54	
	6 B.A.C. 4006	6	13 4	15 56	197	219	14 5	16 57	100	134	
	11 φ Ophiuchi	5	14 58	17 30	168	152	Star 2'.0	south of	♈'s limb.		
	23 δ Arietis	4½	8 4	9 50	321	16	8 49	10 35	49	103	
	28 f Geminor.*	6	14 46	16 11	316	3	15 10	16 35	12	57	
Mar.	1 29 Cancri †	6	15 7	16 29	256	306	15 59	17 20	66	111	
	22 40 Arietis	6	7 55	7 55	303	357	8 49	8 49	71	123	
	25 α Tauri	6	9 10	8 58	295	352	10 7	9 55	46	103	
	26 16 Geminor.*	6	13 45	13 28	286	333	14 30	14 13	52	95	
	29 60 Cancri *	6	15 27	14 59	195	245	15 58	15 29	124	173	
April	3 B.A.C. 4312	6½	10 23	9 35	299	267	11 2	10 15	0	336	
	9 ε' Sagittarii	6	17 7	15 55	315	293	18 15	17 2	66	58	
	12 c' Capricor.	6	16 23	14 59	308	258	17 25	16 0	91	45	
	12 c' Capricor.	6½	16 59	15 35	240	192	17 42	16 18	161	117	
	13 α Aquarii	5	16 48	15 20	249	198	17 33	16 4	154	105	
	14 9 Piscium *	6	16 26	14 53	315	265	17 15	15 43	87	36	
	21 105 Tauri	6	10 8	8 10	282	337	11 5	9 7	64	117	
	25 29 Cancri	6	10 47	8 33	292	337	11 38	9 23	16	66	
	25 B.A.C. 2872	6½	14 15	12 0	208	260	14 57	12 43	110	160	
	28 B.A.C. 3726	6	12 55	10 29	288	321	13 45	11 19	12	54	
May	30 φ Virginis	6	15 20	12 45	226	264	16 26	13 51	86	131	
	6 B.A.C. 6336	6½	17 44	14 45	349	339	19 4	16 5	94	101	
	6 B.A.C. 6347	6½	19 8	16 9	13	21	Star 1'.2	north of	♈'s limb.		
	21 B.A.C. 2432	6½	11 52	7 56	340	35	Star 2'.1	north of	♈'s limb.		
June	1 24 Ophiuchi	6½	14 31	9 50	172	144	Star 0'.0	south of	♈'s limb.		
	2 14 Sagittarii	6	20 47	16 2	353	25	21 11	16 26	33	69	
	18 1 Cancri	6	13 17	7 30	204	257	13 58	8 11	116	168	
	19 α' Cancri †	6	15 5	9 14	182	233	15 27	9 36	137	186	
	23 B.A.C. 4006	6	15 47	9 40	224	270	16 49	10 42	89	139	
July	2 α' Capricor.*	5	14 46	8 4	192	142	Star 1'.8	south of	♈'s limb.		
	3 c' Capricor.	6	18 16	11 29	295	255	19 27	12 40	113	83	
	4 α Aquarii	5	17 18	10 28	242	192	17 57	11 6	163	115	
	5 16 Piscium	6	20 49	13 54	302	263	22 5	15 10	120	95	
	9 φ' Arietis †	6	19 21	12 10	294	247	20 13	13 2	99	48	
	12 γ Tauri	3½	22 38	15 14	222	173	23 11	15 48	148	96	
	13 16 Geminor.*	6	22 34	15 7	323	278	23 6	15 39	38	350	
	13 α Geminor.†	4	22 51	15 24	250	204	23 42	16 15	111	61	
	19 B.A.C. 3726†	6	16 46	8 57	289	339	17 30	9 41	30	81	
	27 14 Sagittarii	6	21 25	13 3	315	352	22 19	13 58	72	116	
	31 51 Aquarii	6	1 18	16 40	331	10	2 13	17 35	85	131	
Aug.	24 29 Sagittarii	6	22 9	11 58	345	23	22 44	12 32	49	92	
	27 α' Capricor.	6	18 59	8 35	316	282	20 7	9 43	94	72	
	28 α Aquarii	5	17 3	6 36	293	243	18 2	7 35	110	62	

OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT WASHINGTON, D. C., DURING THE YEAR 1863.

Date.	Star's Name.	Magnitude.	IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington		Angle from		
			Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			^h ^m	^h ^m	[°]	[°]	^h ^m	^h ^m	[°]	[°]	^h ^m
Aug. 30	51 Piscium	6½	20 6	9 30	275	225	21 7	10 31	130	93	1 1
Sept. 3	ω ² Tauri	5½	3 3	16 11	221	187	3 49	16 57	160	148	0 46
8	20 Cancri	6	2 17	15 5	277	225	3 18	16 6	61	8	1 1
21	B.A.C. 6658	6	22 51	10 49	20	60	Star 0'0	north of	☾'s	limb.	
24	51 Aquarii	6	1 6	12 52	336	13	2 0	13 46	80	124	0 53
	25 π Piscium †	4½	5 17	16 58	293	344	6 9	17 50	108	158	0 52
	25 9 Piscium *	6	5 23	17 5	258	309	6 7	17 49	142	193	0 44
Oct. 2	ε Tauri	3½	1 26	12 40	6	310	Star 1'4	north of	☾'s	limb.	
6	60 Cancri	6	2 30	13 28	168	117	Star 0'3	south of	☾'s	limb.	
6	α Cancri	4	3 11	14 9	285	233	4 9	15 7	47	354	0 58
	18 B.A.C. 6536	6½	21 24	7 36	318	347	22 26	8 38	79	118	1 2
	20 ν Aquarii	4½	1 18	11 21	320	5	2 12	12 16	89	138	0 54
	21 30 Aquarii	5½	1 38	11 38	27	71	Star 0'8	north of	☾'s	limb.	
	29 ι Tauri	5½	22 2	7 31	202	151	22 15	7 44	173	124	0 13
	30 χ ¹ Orionis	5	23 18	8 42	253	202	0 12	9 37	115	61	0 54
Nov. 1	1 Cancri	6	6 56	16 12	242	219	8 29	17 45	76	95	1 33
	2 B.A.C. 2872*	6½	0 38	9 50	245	201	1 31	10 43	95	46	0 52
	2 A ¹ Cancri	6	5 56	15 7	234	188	7 22	16 33	85	55	1 26
	3 ω Leonis	6	5 15	14 23	233	182	6 30	15 37	86	41	1 14
	5 ρ ² Leonis	6	8 11	17 10	206	167	9 18	18 17	95	68	1 7
	14 29 Sagittarii	6	21 49	6 15	220	262	22 16	6 42	173	218	0 27
	19 π Piscium	4½	21 42	5 48	1	334	22 20	6 26	59	41	0 38
	19 9 Piscium	6	21 24	5 30	317	285	22 39	6 45	104	91	1 15
	19 16 Piscium	6	3 30	11 36	249	304	4 16	12 21	158	212	0 46
	26 B.A.C. 1835	6½	2 54	10 32	326	272	3 44	11 21	39	351	0 50
	26 χ ¹ Orionis	5	7 38	15 15	170	216	Star 1'1	south of	☾'s	limb.	
	30 π Cancri	5	4 16	11 37	210	157	5 7	12 29	118	67	0 52
Dec. 12	B.A.C. 6658	6	23 9	5 44	284	326	0 9	6 44	114	162	1 0
	15 51 Aquarii	6	1 16	7 39	304	344	2 17	8 41	126	172	1 2
	20 π Arietis	5½	3 52	9 55	313	344	5 7	11 10	77	125	1 15
	21 13 Tauri	6½	3 34	9 33	318	318	4 47	10 46	66	101	1 13
	26 1 Cancri	6	0 42	6 22	259	207	1 39	7 18	87	39	0 57
	27 60 Cancri	6	8 15	13 50	209	195	9 31	15 6	99	116	1 15

* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

The *Angles of Position*, for the points of contact, are for *direct vision*, and are reckoned from the Moon's *North Point* and from its *Vertex* towards the West. For *inverted image*, add 180° to the angles given.

438 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME.

JANUARY.

			d	h	m	s				d	h	m	s
I.	Eclipse	Disapp.	1	8	37	12.4	I.	Transit	Egress	9	11	5	
I.	Occult.	Reapp.	1	12	0		II.	Eclipse	Disapp. W.	9	13	37	4.9
I.	Shadow	Ingress	2	5	45		II.	Occult.	Reapp.	9	18	31	
I.	Transit	Ingress	2	6	57		III.	Shadow	Ingress	10	2	14	
I.	Shadow	Egress	2	7	59		III.	Shadow	Egress	10	4	58	
I.	Transit	Egress	2	9	10		I.	Eclipse	Disapp.	10	4	58	51.3
II.	Eclipse	Disapp.	2	11	3	52.7	III.	Transit	Ingress	10	7	19	
II.	Occult.	Reapp. W.	2	15	56		I.	Occult.	Reapp.	10	8	24	
III.	Shadow	Ingress	2	22	16		III.	Transit	Egress	10	9	44	
III.	Shadow	Egress	3	1	1		I.	Shadow	Ingress	11	2	5	
I.	Eclipse	Disapp.	3	3	5	30.7	I.	Transit	Ingress	11	3	20	
III.	Transit	Ingress	3	3	15		I.	Shadow	Egress	11	4	20	
III.	Transit	Egress	3	5	44		I.	Transit	Egress	11	5	33	
I.	Occult.	Reapp.	3	6	29		II.	Shadow	Ingress	11	8	36	
I.	Shadow	Ingress	4	0	13		II.	Transit	Ingress	11	11	5	
I.	Transit	Ingress	4	1	26		II.	Shadow	Egress	11	11	11	
I.	Shadow	Egress	4	2	27		II.	Transit	Egress W.	11	13	33	
I.	Transit	Egress	4	3	39		I.	Eclipse	Disapp.	11	23	27	14.7
II.	Shadow	Ingress	4	6	1		I.	Occult.	Reapp.	12	2	52	
II.	Transit	Ingress	4	8	27		I.	Shadow	Ingress	12	20	84	
II.	Shadow	Egress	4	8	36		I.	Transit	Ingress	12	21	48	
II.	Transit	Egress	4	10	56		I.	Shadow	Egress	12	22	48	
I.	Eclipse	Disapp.	4	21	33	54.6	I.	Transit	Egress	13	0	1	
I.	Occult.	Reapp.	5	0	58		II.	Eclipse	Disapp.	13	2	53	45.2
I.	Shadow	Ingress	5	18	41		II.	Occult.	Reapp	13	7	49	
I.	Transit	Ingress	5	19	54		III.	Eclipse	Disapp. W.	13	16	31	21.5
I.	Shadow	Egress	5	20	55		I.	Eclipse	Disapp. W.	13	17	55	30.6
I.	Transit	Egress	5	22	7		III.	Eclipse	Reapp.	13	19	1	45.3
II.	Eclipse	Disapp.	6	0	20	29.1	I.	Occult.	Reapp.	13	21	21	
II.	Occult.	Reapp.	6	5	14		III.	Occult.	Disapp.	13	21	34	
III.	Eclipse	Disapp.	6	12	33	37.5	III.	Occult.	Reapp.	13	23	57	
III.	Eclipse	Reapp. W.	6	15	4	57.7	I.	Shadow	Ingress W.	13	15	2	
I.	Eclipse	Disapp. W.	6	16	2	11.1	I.	Transit	Ingress W.	14	16	17	
III.	Occult.	Disapp. W.	6	17	32		I.	Shadow	Egress W.	14	17	16	
I.	Occult.	Reapp.	6	19	27		I.	Transit	Egress	14	18	30	
III.	Occult.	Reapp.	6	19	57		II.	Shadow	Ingress	14	21	54	
I.	Shadow	Ingress	7	13	9		II.	Transit	Ingress	15	0	23	
I.	Transit	Ingress W.	7	14	23		II.	Shadow	Egress	15	0	29	
I.	Shadow	Egress W.	7	15	23		II.	Transit	Egress	15	2	51	
I.	Transit	Egress W.	7	16	36		I.	Eclipse	Disapp.	15	12	23	52.6
II.	Shadow	Ingress	7	19	19		I.	Occult.	Reapp. W.	15	15	49	
II.	Transit	Ingress	7	21	46		I.	Shadow	Ingress	16	9	30	
II.	Shadow	Egress	7	21	54		I.	Transit	Ingress	16	10	45	
II.	Transit	Egress	8	0	15		I.	Shadow	Egress	16	11	44	
I.	Eclipse	Disapp.	8	10	30	33.6	I.	Transit	Egress	16	12	58	
I.	Occult.	Reapp. W.	8	13	56		II.	Eclipse	Disapp. W.	16	16	10	23.2
I.	Shadow	Ingress	9	7	37		II.	Occult.	Reapp.	16	21	5	
I.	Transit	Ingress	9	8	52		III.	Shadow	Ingress	17	6	11	
I.	Shadow	Egress	9	9	51		I.	Eclipse	Disapp.	17	6	52	9.9

JUPITER'S SATELLITES, 1863. 439

WASHINGTON MEAN TIME.

JANUARY.

			d	h	m	s				d	h	m	s
III.	Shadow	Egress	17	8	54		III.	Transit	Ingress W.	24	15	15	
I.	Occult.	Reapp.	17	10	18		III.	Transit	Egress W.	24	17	44	
III.	Transit	Ingress	17	11	19		I.	Shadow	Ingress	25	5	52	
III.	Transit	Egress W.	17	13	41		I.	Transit	Ingress	25	7	5	
I.	Shadow	Ingress	18	3	59		I.	Shadow	Egress	25	8	6	
I.	Transit	Ingress	18	5	13		I.	Transit	Egress	25	9	18	
I.	Shadow	Egress	18	6	13		II.	Shadow	Ingress W.	25	13	46	
I.	Transit	Egress	18	7	26		II.	Transit	Ingress W.	25	16	14	
II.	Shadow	Ingress	18	11	11		II.	Shadow	Egress W.	25	16	20	
II.	Transit	Ingress W.	18	13	41		II.	Transit	Egress	25	18	41	
II.	Shadow	Egress W.	18	13	45		I.	Eclipse	Disapp.	26	3	13	49.9
II.	Transit	Egress W.	18	16	8		I.	Occult.	Reapp.	26	6	38	
I.	Eclipse	Disapp.	19	1	20	32.9	I.	Shadow	Ingress	27	0	20	
I.	Occult.	Reapp.	19	4	46		I.	Transit	Ingress	27	1	33	
I.	Shadow	Ingress	19	22	27		I.	Shadow	Egress	27	2	34	
I.	Transit	Ingress	19	23	41		I.	Transit	Egress	27	3	46	
I.	Shadow	Egress	20	0	41		II.	Eclipse	Disapp.	27	8	0	40.1
I.	Transit	Egress	20	1	54		II.	Occult.	Reapp.	27	12	52	
II.	Eclipse	Disapp.	20	5	27	8.7	I.	Eclipse	Disapp.	27	21	42	6.0
II.	Occult.	Reapp.	20	10	21		III.	Eclipse	Disapp.	28	0	26	42.0
I.	Eclipse	Disapp.	20	19	48	48.8	I.	Occult.	Reapp.	28	1	6	
III.	Eclipse	Disapp.	20	20	29	18.1	III.	Eclipse	Reapp.	28	2	55	13.2
III.	Eclipse	Reapp.	20	22	58	45.5	III.	Occult.	Disapp.	28	5	25	
I.	Occult.	Reapp.	20	23	14		III.	Occult.	Reapp.	28	7	42	
III.	Occult.	Disapp.	21	1	32		I.	Shadow	Ingress	28	18	49	
III.	Occult.	Reapp.	21	3	52		I.	Transit	Ingress	28	20	1	
I.	Shadow	Ingress W.	21	16	55		I.	Shadow	Egress	28	21	3	
I.	Transit	Ingress	21	18	9		I.	Transit	Egress	28	22	14	
I.	Shadow	Egress	21	19	9		II.	Shadow	Ingress	29	3	4	
I.	Transit	Egress	21	20	22		II.	Transit	Ingress	29	5	31	
II.	Shadow	Ingress	22	0	29		II.	Shadow	Egress	29	5	38	
II.	Transit	Ingress	22	2	58		II.	Transit	Egress	29	7	57	
II.	Shadow	Egress	22	3	3		I.	Eclipse	Disapp. W.	29	16	10	27.2
II.	Transit	Egress	22	5	25		I.	Occult.	Reapp.	29	19	34	
I.	Eclipse	Disapp. W.	22	14	17	10.3	I.	Shadow	Ingress W.	30	13	17	
I.	Occult.	Reapp. W.	22	17	42		I.	Transit	Ingress W.	30	14	29	
I.	Shadow	Ingress	23	11	24		I.	Shadow	Egress W.	30	15	31	
I.	Transit	Ingress	23	12	37		I.	Transit	Egress W.	30	16	42	
I.	Shadow	Egress W.	23	13	38		II.	Eclipse	Disapp.	30	21	17	23.5
I.	Transit	Egress W.	23	14	50		II.	Occult.	Reapp.	31	2	7	
II.	Eclipse	Disapp.	23	18	43	49.4	I.	Eclipse	Disapp.	31	10	38	44.2
II.	Occult.	Reapp.	23	23	37		I.	Occult.	Reapp. W.	31	14	2	
I.	Eclipse	Disapp.	24	8	45	27.5	III.	Shadow	Ingress W.	31	14	6	
III.	Shadow	Ingress	24	10	9		III.	Shadow	Egress W.	31	16	48	
I.	Occult.	Reapp.	24	12	10		III.	Transit	Ingress	31	19	7	
III.	Shadow	Egress W.	24	12	51		III.	Transit	Egress	31	21	23	

440 JUPITER'S SATELLITES, 1863.

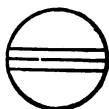
WASHINGTON MEAN TIME.

JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.

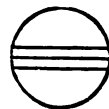
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III.

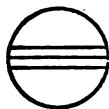
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II.

d
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IV. *Not Eclipsed.*

FEBRUARY.

			d	h	m	s				d	h	m	s
I.	Shadow	Ingress	1	7	45					I.	Eclipse	Disapp.	5 18 3 44.1
I.	Transit	Ingress	1	8	57					I.	Occult.	Reapp.	5 21 25
I.	Shadow	Egress	1	9	59					I.	Shadow	Ingress W.	6 15 10
I.	Transit	Egress	1	11	9					I.	Transit	Ingress W.	6 16 20
II.	Shadow	Ingress W.	1	16	21					I.	Shadow	Egress W.	6 17 24
II.	Transit	Ingress	1	18	46					I.	Transit	Egress	6 18 32
II.	Shadow	Egress	1	18	55					II.	Eclipse	Disapp.	6 23 51 7.3
II.	Transit	Egress	1	21	12					II.	Occult.	Reapp.	7 4 35
I.	Eclipse	Disapp.	2	5	7	7.5				I.	Eclipse	Disapp. W.	7 12 32 1.4
I.	Occult.	Reapp.	2	8	29					I.	Occult.	Reapp. W.	7 15 52
I.	Shadow	Ingress	3	2	13					III.	Shadow	Ingress	7 18 3
I.	Transit	Ingress	3	3	24					III.	Shadow	Egress	7 20 44
I.	Shadow	Egress	3	4	27					III.	Transit	Ingress	7 22 53
I.	Transit	Egress	3	5	36					III.	Transit	Egress	8 1 6
II.	Eclipse	Disapp.	3	10	34	20.3				I.	Shadow	Ingress	8 9 39
II.	Occult.	Reapp. W.	3	15	21					I.	Transit	Ingress	8 10 48
I.	Eclipse	Disapp.	3	23	35	23.2				I.	Shadow	Egress W.	8 11 43
I.	Occult.	Reapp.	4	2	57					I.	Transit	Egress W.	8 13 0
III.	Eclipse	Disapp.	4	4	23	59.9				II.	Shadow	Ingress	8 18 55
III.	Eclipse	Reapp.	4	6	51	35.1				II.	Transit	Ingress	8 21 14
III.	Occult.	Disapp.	4	9	14					II.	Shadow	Egress	8 21 29
III.	Occult.	Reapp.	4	11	28					II.	Transit	Egress	8 23 40
I.	Shadow	Ingress	4	20	42					I.	Eclipse	Disapp.	9 7 0 24.0
I.	Transit	Ingress	4	21	52					I.	Occult.	Reapp.	9 10 19
I.	Shadow	Egress	4	22	56					I.	Shadow	Ingress	10 4 7
I.	Transit	Egress	5	0	4					I.	Transit	Ingress	10 5 15
II.	Shadow	Ingress	5	5	38					I.	Shadow	Egress	10 6 21
II.	Transit	Ingress	5	8	0					I.	Transit	Egress	10 7 27
II.	Shadow	Egress	5	8	12					II.	Eclipse	Disapp. W.	10 13 8 11 4
II.	Transit	Egress	5	10	26					II.	Occult.	Reapp. W.	10 17 48

JUPITER'S SATELLITES, 1863. 441

WASHINGTON MEAN TIME.

FEBRUARY.

			d	h	m	s				d	h	m	s
I.	Eclipse	Disapp.	11	1	28	40.1	III.	Occult.	Reapp.	18	18	47	
I.	Occult.	Reapp.	11	4	46		I.	Shadow	Ingress	19	0	28	
III.	Eclipse	Disapp.	11	8	21	28.9	I.	Transit	Ingress	19	1	30	
III.	Eclipse	Reapp.	11	10	48	8.1	I.	Shadow	Egress	19	2	44	
III.	Occult.	Disapp. W.	11	13	0		I.	Transit	Egress	19	3	42	
III.	Occult.	Reapp. W.	11	15	11		II.	Shadow	Ingress	19	10	47	
I.	Shadow	Ingress	11	22	35		II.	Transit	Ingress W.	19	12	54	
I.	Transit	Ingress	11	23	42		II.	Shadow	Egress W.	19	13	20	
I.	Shadow	Egress	12	0	49		II.	Transit	Egress W.	19	15	18	
I.	Transit	Egress	12	1	54		I.	Eclipse	Disapp.	19	21	50	20.0
II.	Shadow	Ingress	12	8	12		I.	Occult.	Reapp.	20	1	2	
II.	Transit	Ingress	12	10	29		I.	Shadow	Ingress	20	18	56	
II.	Shadow	Egress	12	10	46		I.	Transit	Ingress	20	19	57	
II.	Transit	Egress W.	12	12	54		I.	Shadow	Egress	20	21	10	
I.	Eclipse	Disapp.	12	19	57	1.5	I.	Transit	Egress	20	22	9	
I.	Occult.	Reapp.	12	23	13		II.	Eclipse	Disapp.	21	4	59	9.6
I.	Shadow	Ingress W.	13	17	3		II.	Occult.	Reapp.	21	9	25	
I.	Transit	Ingress	13	18	9		I.	Eclipse	Disapp. W.	21	16	18	38.5
I.	Shadow	Egress	13	19	17		I.	Occult.	Reapp.	21	19	29	
I.	Transit	Egress	13	20	21		III.	Shadow	Ingress	22	2	0	
II.	Eclipse	Disapp.	14	2	25	2.4	III.	Shadow	Egress	22	4	38	
II.	Occult.	Reapp.	14	7	1		III.	Transit	Ingress	22	6	14	
I.	Eclipse	Disapp. W.	14	14	25	19.1	III.	Transit	Egress	22	8	21	
I.	Occult.	Reapp. W.	14	17	41		I.	Shadow	Ingress W.	22	13	25	
III.	Shadow	Ingress	14	22	2		I.	Transit	Ingress W.	22	14	24	
III.	Shadow	Egress	15	0	41		I.	Shadow	Egress W.	22	15	38	
III.	Transit	Ingress	15	2	37		I.	Transit	Egress W.	22	16	36	
III.	Transit	Egress	15	4	46		II.	Shadow	Ingress	23	0	4	
I.	Shadow	Ingress W.	15	11	31		II.	Transit	Ingress	23	2	6	
I.	Transit	Ingress W.	15	12	36		II.	Shadow	Egress	23	2	37	
I.	Shadow	Egress W.	15	13	45		II.	Transit	Egress	23	4	30	
I.	Transit	Egress W.	15	14	48		I.	Eclipse	Disapp.	23	10	47	1.4
II.	Shadow	Ingress	15	21	30		I.	Occult.	Reapp. W.	23	13	56	
II.	Transit	Ingress	15	23	42		I.	Shadow	Ingress	24	7	53	
II.	Shadow	Egress	16	0	3		I.	Transit	Ingress	24	8	51	
II.	Transit	Egress	16	2	6		I.	Shadow	Egress	24	10	6	
I.	Eclipse	Disapp.	16	8	53	41.9	I.	Transit	Egress W.	24	11	3	
I.	Occult.	Reapp. W.	16	12	8		II.	Eclipse	Disapp.	24	18	16	30.0
I.	Shadow	Ingress	17	6	0		II.	Occult.	Reapp.	24	22	36	
I.	Transit	Ingress	17	7	3		I.	Eclipse	Disapp.	25	5	15	19.1
I.	Shadow	Egress	17	8	14		I.	Occult.	Reapp.	25	8	23	
I.	Transit	Egress	17	9	15		III.	Eclipse	Disapp. W.	25	16	17	24.5
II.	Eclipse	Disapp. W.	17	15	42	14.3	III.	Eclipse	Reapp.	25	18	42	12.1
II.	Occult.	Reapp.	17	20	13		III.	Occult.	Disapp.	25	20	15	
I.	Eclipse	Disapp.	18	3	21	58.7	III.	Occult.	Reapp.	25	22	20	
I.	Occult.	Reapp.	18	6	35		I.	Shadow	Ingress	26	2	21	
III.	Eclipse	Disapp. W.	18	12	19	6.1	I.	Transit	Ingress	26	3	18	
III.	Eclipse	Reapp. W.	18	14	44	49.5	I.	Shadow	Egress	26	4	35	
III.	Occult.	Disapp. W.	18	16	39		I.	Transit	Egress	26	5	30	

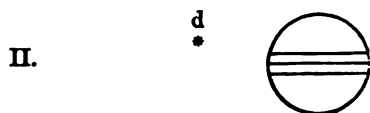
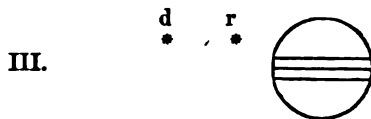
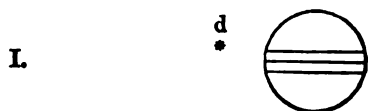
442 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME.

FEBRUARY.

II. Shadow	Ingress W.	d ^d h ^h m ^m s ^s	I. Transit	Ingress	d ^d h ^h m ^m s ^s
II. Transit	Ingress W.	26 13 22	I. Shadow	Egress	27 21 46
II. Shadow	Egress W.	26 15 17	I. Transit	Egress	27 23 3
II. Transit	Egress	26 15 55	II. Eclipse	Disapp.	27 23 57
I. Eclipse	Disapp.	26 17 41	II. Occult.	Reapp. W.	28 7 33 30.3
I. Occult.	Reapp.	26 23 43 40.6	I. Eclipse	Disapp.	28 11 47
I. Shadow	Ingress	27 2 50	I. Occult.	Reapp.	28 18 11 59.6
		27 20 49			28 21 17

Phases of the Eclipses of the Satellites for an Inverting Telescope.



IV. *Not Eclipsed.*

MARCH.

III. Shadow	Ingress	d ^d h ^h m ^m s ^s	III. Eclipse	Disapp.	d ^d h ^h m ^m s ^s
III. Shadow	Egress	1 5 57	III. Eclipse	Reapp.	4 20 15 16.6
III. Transit	Ingress	1 8 34	III. Occult.	Disapp.	4 22 39 8.8
III. Transit	Egress W.	1 9 47	III. Occult.	Reapp.	4 23 47
I. Shadow	Ingress W.	1 11 52	I. Shadow	Ingress	5 1 50
I. Transit	Ingress W.	1 15 18	I. Transit	Ingress	5 4 15
I. Shadow	Egress W.	1 16 12	I. Shadow	Egress	5 5 5
I. Transit	Egress	1 17 32	I. Transit	Egress	5 6 28
I. Shadow	Ingress	1 18 24	II. Shadow	Ingress W.	5 7 17
II. Shadow	Ingress	2 2 39	II. Transit	Ingress	5 15 56
II. Transit	Ingress	2 4 28	II. Shadow	Egress	5 17 38
II. Shadow	Egress	2 5 11	II. Shadow	Egress	5 18 28
II. Transit	Egress	2 6 52	II. Transit	Egress	5 20 2
I. Eclipse	Disapp. W.	2 12 40 23.3	I. Eclipse	Disapp.	6 1 37 4.1
I. Occult.	Reapp. W.	2 15 44	I. Occult.	Reapp.	6 4 36
I. Shadow	Ingress	3 9 46	I. Shadow	Ingress	6 22 43
I. Transit	Ingress W.	3 10 39	I. Transit	Ingress	6 23 31
I. Shadow	Egress W.	3 12 0	I. Shadow	Egress	7 0 56
I. Transit	Egress W.	3 12 51	I. Transit	Egress	7 1 43
II. Eclipse	Disapp.	3 20 50 59.6	II. Eclipse	Disapp. W.	7 10 8 4.5
II. Occult.	Reapp.	4 0 58	II. Occult.	Reapp. W.	7 14 8
I. Eclipse	Disapp.	4 7 8 41.7	I. Eclipse	Disapp.	7 20 5 24.0
I. Occult.	Reapp. W.	4 10 10	I. Occult.	Reapp.	7 23 3

JUPITER'S SATELLITES, 1863. 443

WASHINGTON MEAN TIME.

MARCH.

				d	h	m	s					d	h	m	s
III.	Shadow	Ingress	W.	8	9	55		I.	Transit	Ingress		15	19	43	
III.	Shadow	Egress	W.	8	12	32		I.	Shadow	Egress		15	21	18	
III.	Transit	Ingress	W.	8	13	15		I.	Transit	Egress		15	21	55	
III.	Transit	Egress	W.	8	15	19		II.	Shadow	Ingress		16	7	47	
I.	Shadow	Ingress	W.	8	17	12		II.	Transit	Ingress	W.	16	9	6	
I.	Transit	Ingress		8	17	58		II.	Shadow	Egress	W.	16	10	19	
I.	Shadow	Egress		8	19	25		II.	Transit	Egress	W.	16	11	29	
I.	Transit	Egress		8	20	10		I.	Eclipse	Disapp.	W.	16	16	27	17.6
II.	Shadow	Ingress		9	5	13		I.	Occult.	Reapp.		16	19	14	
II.	Transit	Ingress		9	6	48		I.	Shadow	Ingress	W.	17	13	33	
II.	Shadow	Egress		9	7	45		I.	Transit	Ingress	W.	17	14	9	
II.	Transit	Egress		9	9	12		I.	Shadow	Egress	W.	17	15	47	
I.	Eclipse	Disapp.	W.	9	14	33	48.4	I.	Transit	Egress	W.	17	16	21	
I.	Occult.	Reapp.		9	17	30		II.	Eclipse	Disapp.		18	2	0	42.0
I.	Shadow	Ingress	W.	10	11	40		II.	Occult.	Reapp.		18	5	36	
I.	Transit	Ingress	W.	10	12	25		I.	Eclipse	Disapp.	W.	18	10	55	38.7
I.	Shadow	Egress	W.	10	13	53		I.	Occult.	Reapp.	W.	18	13	40	
I.	Transit	Egress	W.	10	14	37		III.	Eclipse	Disapp.		19	4	11	7.4
II.	Eclipse	Disapp.		10	23	25	43.2	III.	Eclipse	Reapp.		19	6	33	9.4
II.	Occult.	Reapp.		11	3	18		III.	Occult.	Disapp.		19	6	34	
I.	Eclipse	Disapp.		11	9	2	8.1	I.	Shadow	Ingress		19	8	1	
I.	Occult.	Reapp.	W.	11	11	56		I.	Transit	Ingress		19	8	36	
III.	Eclipse	Disapp.		12	0	13	25.1	III.	Occult.	Reapp.		19	8	38	
III.	Eclipse	Reapp.		12	2	36	22.1	I.	Shadow	Egress	W.	19	10	15	
III.	Occult.	Disapp.		12	3	12		I.	Transit	Egress	W.	19	10	48	
III.	Occult.	Reapp.		12	5	16		II.	Shadow	Ingress		19	21	4	
I.	Shadow	Ingress		12	6	8		II.	Transit	Ingress		19	22	14	
I.	Transit	Ingress		12	6	51		II.	Shadow	Egress		19	23	36	
I.	Shadow	Egress		12	8	21		II.	Transit	Egress		20	0	37	
I.	Transit	Egress		12	9	3		I.	Eclipse	Disapp.		20	5	24	29
II.	Shadow	Ingress		12	18	30		I.	Occult.	Reapp.		20	8	6	
II.	Transit	Ingress		12	19	57		I.	Shadow	Ingress		21	2	30	
II.	Shadow	Egress		12	21	2		I.	Transit	Ingress		21	3	2	
II.	Transit	Egress		12	22	21		I.	Shadow	Egress		21	4	44	
I.	Eclipse	Disapp.		13	3	30	31.2	I.	Transit	Egress		21	5	14	
I.	Occult.	Reapp.		13	6	22		II.	Eclipse	Disapp.	W.	21	15	17	57.8
I.	Shadow	Ingress		14	0	37		II.	Occult.	Reapp.		21	18	44	
I.	Transit	Ingress		14	1	17		I.	Eclipse	Disapp.		21	23	52	25.2
I.	Shadow	Egress		14	2	50		I.	Occult.	Reapp.		22	2	32	
I.	Transit	Egress		14	3	29		III.	Shadow	Ingress		22	17	50	
II.	Eclipse	Disapp.	W.	14	12	42	53.9	III.	Transit	Ingress		22	20	1	
II.	Occult.	Reapp.	W.	14	16	27		III.	Shadow	Egress		22	20	27	
I.	Eclipse	Disapp.		14	21	58	52.2	I.	Shadow	Ingress		22	20	58	
I.	Occult.	Reapp.		15	0	48		I.	Transit	Ingress		22	21	28	
III.	Shadow	Ingress	W.	15	13	52		III.	Transit	Egress		22	22	6	
III.	Shadow	Egress	W.	15	16	29		I.	Shadow	Egress		22	23	12	
III.	Transit	Ingress	W.	15	16	40		I.	Transit	Egress		22	23	40	
III.	Transit	Egress		15	18	44		II.	Shadow	Ingress	W.	23	10	21	
I.	Shadow	Ingress		15	19	5		II.	Transit	Ingress	W.	23	11	22	

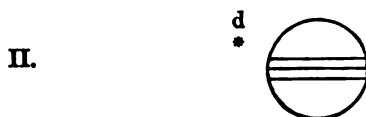
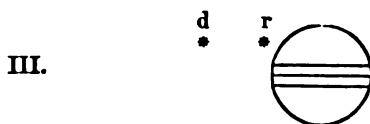
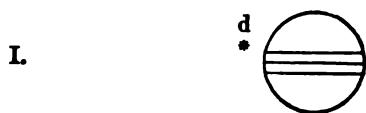
444 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME.

MARCH.

II. Shadow	Egress	W.	^d 23 ^h 12 ^m 53 ^s	I. Transit	Ingress	^d 28 ^h 4 ^m 46 ^s
II. Transit	Egress	W.	23 13 45	I. Shadow	Egress	28 6 38
I. Eclipse	Disapp.		23 18 20 51.9	I. Transit	Egress	28 6 58
I. Occult.	Reapp.		23 20 58	II. Eclipse	Disapp.	28 17 53 18.1
I. Shadow	Ingress	W.	24 15 27	II. Occult.	Reapp.	28 21 0
I. Transit	Ingress	W.	24 15 54	I. Eclipse	Disapp.	29 1 46 3.2
I. Shadow	Egress		24 17 41	I. Occult.	Reapp.	29 4 16
I. Transit	Egress		24 18 6	III. Shadow	Ingress	29 21 49
II. Eclipse	Disapp.		25 4 35 56.2	I. Shadow	Ingress	29 22 52
II. Occult.	Reapp.		25 7 52	I. Transit	Ingress	29 23 12
I. Eclipse	Disapp.	W.	25 12 49 14.5	III. Transit	Ingress	29 23 19
I. Occult.	Reapp.	W.	25 15 24	III. Shadow	Egress	30 0 24
III. Eclipse	Disapp.		26 8 8 49.6	I. Shadow	Egress	30 1 6
I. Shadow	Ingress		26 9 55	I. Transit	Egress	30 1 24
I. Transit	Ingress	W.	26 10 20	III. Transit	Egress	30 1 25
III. Occult.	Reapp.	W.	26 11 58	II. Shadow	Ingress	W. 30 12 55
I. Shadow	Egress	W.	26 12 9	II. Transit	Ingress	W. 30 13 35
I. Transit	Egress	W.	26 12 32	II. Shadow	Egress	W. 30 15 27
II. Shadow	Ingress		26 23 38	II. Transit	Egress	W. 30 16 0
II. Transit	Ingress		27 0 29	I. Eclipse	Disapp.	30 20 14 31.2
II. Shadow	Egress		27 2 10	I. Occult.	Reapp.	30 22 42
II. Transit	Egress		27 2 52	I. Shadow	Ingress	31 17 21
I. Eclipse	Disapp.		27 7 17 39.7	I. Transit	Ingress	31 17 38
I. Occult.	Reapp.	W.	27 9 50	I. Shadow	Egress	31 19 35
I. Shadow	Ingress		28 4 24	I. Transit	Egress	31 19 50

Phases of the Eclipses of the Satellites for an Inverting Telescope.



IV. *Not Eclipsed.*

APRIL.

II. Eclipse	Disapp.	^d 1 ^h 7 ^m 11 ^s 26.6	I. Shadow	Ingress	W.	^d 2 ^h 11 ^m 49 ^s
II. Occult.	Reapp.	W. 1 10 7	I. Transit	Ingress	W.	2 12 4
I. Eclipse	Disapp.	W. 1 14 42 55.4	III. Eclipse	Disapp.	W.	2 12 6 50.4
I. Occult.	Reapp.	1 17 8	I. Shadow	Egress	W.	2 14 3

JUPITER'S SATELLITES, 1863. 445

WASHINGTON MEAN TIME.

APRIL.

				d	h	m	s					d	h	m	s
I.	Transit	Egress	W.	2	14	16		I.	Occult.	Reapp.	W.	10	13	18	
III.	Occult.	Reapp.	W.	2	15	16		I.	Shadow	Ingress	W.	11	8	12	
II.	Shadow	Ingress		3	2	12		I.	Transit	Ingress	W.	11	8	14	
II.	Transit	Ingress		3	2	42		I.	Shadow	Egress	W.	11	10	25	
II.	Shadow	Egress		3	4	44		I.	Transit	Egress	W.	11	10	26	
II.	Transit	Egress		3	5	6		II.	Eclipse	Disapp.		11	23	4	45.7
I.	Eclipse	Disapp.	W.	3	9	11	21.8	II.	Eclipse	Reapp.		12	1	30	3.9
I.	Occult.	Reapp.	W.	3	11	34		I.	Occult.	Disapp.		12	5	32	
I.	Shadow	Ingress		4	6	18		I.	Occult.	Reapp.	W.	12	7	44	
I.	Transit	Ingress		4	6	30		I.	Transit	Ingress		13	2	40	
I.	Shadow	Egress	W.	4	8	32		I.	Shadow	Ingress		13	2	41	
I.	Transit	Egress	W.	4	8	42		I.	Transit	Egress		13	4	52	
II.	Eclipse	Disapp.		4	20	28	54.4	I.	Shadow	Egress		13	4	54	
II.	Occult.	Reapp.		4	23	15		III.	Shadow	Ingress		13	5	46	
I.	Eclipse	Disapp.		5	3	39	46.4	III.	Transit	Ingress		13	5	51	
I.	Occult.	Reapp.		5	6	0		III.	Transit	Egress	W.	13	8	2	
I.	Shadow	Ingress		6	0	46		III.	Shadow	Egress	W.	13	8	19	
I.	Transit	Ingress		6	0	56		II.	Transit	Ingress		13	18	2	
III.	Shadow	Ingress		6	1	46		II.	Shadow	Ingress		13	18	3	
III.	Transit	Ingress		6	2	34		II.	Transit	Egress		13	20	27	
I.	Shadow	Egress		6	3	0		II.	Shadow	Egress		13	20	34	
I.	Transit	Egress		6	3	8		I.	Occult.	Disapp.		13	23	58	
III.	Shadow	Egress		6	4	20		I.	Eclipse	Reapp.		14	2	10	25.6
III.	Transit	Egress		6	4	42		I.	Transit	Ingress		14	21	6	
II.	Shadow	Ingress	W.	6	15	29		I.	Shadow	Ingress		14	21	9	
II.	Transit	Ingress	W.	6	15	49		I.	Transit	Egress		14	23	18	
II.	Shadow	Egress		6	18	1		I.	Shadow	Egress		14	23	22	
II.	Transit	Egress		6	18	13		II.	Occult.	Disapp.	W.	15	12	13	
I.	Eclipse	Disapp.		6	22	8	15.6	II.	Eclipse	Reapp.	W.	15	14	48	23.0
I.	Occult.	Reapp.		7	0	26		I.	Occult.	Disapp.		15	18	24	
I.	Shadow	Ingress		7	19	15		I.	Eclipse	Reapp.		15	20	38	51.6
I.	Transit	Ingress		7	19	22		I.	Transit	Ingress	W.	16	15	32	
I.	Shadow	Egress		7	21	28		I.	Shadow	Ingress	W.	16	15	37	
I.	Transit	Egress		7	21	34		I.	Transit	Egress		16	17	54	
II.	Eclipse	Disapp.	W.	8	9	47	12.4	I.	Shadow	Egress		16	17	49	
II.	Occult.	Reapp.	W.	8	12	23		III.	Occult.	Disapp.		16	19	40	
I.	Eclipse	Disapp.	W.	8	16	36	41.3	III.	Eclipse	Reapp.		16	22	22	26.8
I.	Occult.	Reapp.		8	18	52		II.	Transit	Ingress		17	7	8	
I.	Shadow	Ingress	W.	9	13	43		II.	Shadow	Ingress	W.	17	7	20	
I.	Transit	Ingress	W.	9	13	48		II.	Transit	Egress	W.	17	9	33	
I.	Shadow	Egress	W.	9	15	57		II.	Shadow	Egress	W.	17	9	51	
I.	Transit	Egress	W.	9	16	0		I.	Occult.	Disapp.	W.	17	12	50	
III.	Eclipse	Disapp.	W.	9	16	5	2.6	I.	Eclipse	Reapp.	W.	17	15	7	19.4
III.	Occult.	Reapp.		9	18	34		I.	Transit	Ingress	W.	18	9	58	
II.	Shadow	Ingress		10	4	47		I.	Shadow	Ingress	W.	18	10	6	
II.	Transit	Ingress		10	4	55		I.	Transit	Egress	W.	18	12	10	
II.	Shadow	Egress	W.	10	7	18		I.	Shadow	Egress	W.	18	12	19	
II.	Transit	Egress	W.	10	7	20		II.	Occult.	Disapp.		19	1	21	
I.	Eclipse	Disapp.	W.	10	11	5	9.0	II.	Eclipse	Reapp.		19	4	5	53.9

446 JUPITER'S SATELLITES, 1863.

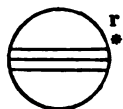
WASHINGTON MEAN TIME.

APRIL.

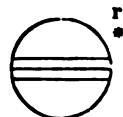
I. Occult.	Disapp. W.	^d 19 ^h 7 ^m 16 ^s	I. Eclipse	Reapp. W.	^d 24 ^h 17 ^m 1 ^s 14.1
I. Eclipse	Reapp. W.	19 9 35 46.2	I. Transit	Ingress W.	25 11 42
I. Transit	Ingress	20 4 24	I. Shadow	Ingress W.	25 12 0
I. Shadow	Ingress	20 4 34	I. Transit	Egress W.	25 13 54
I. Transit	Egress	20 6 36	I. Shadow	Egress W.	25 14 13
I. Shadow	Egress	20 6 47	II. Occult.	Disapp.	26 3 36
III. Transit	Ingress W.	20 9 6	II. Eclipse	Reapp.	26 6 41 58.7
III. Shadow	Ingress W.	20 9 45	I. Occult.	Disapp. W.	26 9 0
III. Transit	Egress W.	20 11 20	I. Eclipse	Reapp. W.	26 11 29 42.2
III. Shadow	Egress W.	20 12 17	I. Transit	Ingress	27 6 8
II. Transit	Ingress	20 20 15	I. Shadow	Ingress	27 6 29
II. Shadow	Ingress	20 20 38	I. Transit	Egress W.	27 8 20
II. Transit	Egress	20 22 40	I. Shadow	Egress W.	27 8 42
II. Shadow	Egress	20 23 8	III. Transit	Ingress W.	27 12 23
I. Occult.	Disapp.	21 1 42	III. Shadow	Ingress W.	27 13 43
I. Eclipse	Reapp.	21 4 4 16.7	III. Transit	Egress W.	27 14 39
I. Transit	Ingress	21 22 50	III. Shadow	Egress W.	27 16 15
I. Shadow	Ingress	21 23 3	II. Transit	Ingress	27 22 28
I. Transit	Egress	22 1 2	II. Shadow	Ingress	27 23 12
I. Shadow	Egress	22 1 16	II. Transit	Egress	28 0 54
II. Occult.	Disapp. W.	22 14 28	II. Shadow	Egress	28 1 42
II. Eclipse	Reapp.	22 17 24 22.2	I. Occult.	Disapp.	28 3 26
I. Occult.	Disapp.	22 20 8	I. Eclipse	Reapp.	28 5 58 14.2
I. Eclipse	Reapp.	22 22 32 44.7	I. Transit	Ingress	29 0 35
I. Transit	Ingress	22 17 16	I. Shadow	Ingress	29 0 58
I. Shadow	Ingress	23 17 31	I. Transit	Egress	29 2 47
I. Transit	Egress	23 19 28	I. Shadow	Egress	29 3 11
I. Shadow	Egress	23 19 44	II. Occult.	Disapp.	29 16 44
III. Occult.	Disapp.	23 22 56	II. Eclipse	Reapp.	29 20 0 35.2
III. Eclipse	Reapp.	24 2 20 6.9	I. Occult.	Disapp.	29 21 52
II. Transit	Ingress W.	24 9 22	I. Eclipse	Reapp.	30 0 26 43.7
II. Shadow	Ingress W.	24 9 55	I. Transit	Ingress	30 19 1
II. Transit	Egress W.	24 11 47	I. Shadow	Ingress	30 19 26
II. Shadow	Egress W.	24 12 25	I. Transit	Egress	30 21 13
I. Occult.	Disapp. W.	24 14 34	I. Shadow	Egress	30 21 39

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



III.



II.



IV. *Not Eclipsed.*

JUPITER'S SATELLITES, 1863. 447

WASHINGTON MEAN TIME.

M A Y.

			d	h	m	s				d	h	m	s
III.	Occult.	Disapp.	1	2	14					II.	Shadow	Egress	8 17 33
III.	Eclipse	Reapp.	1	6	18	5.0				I.	Occult.	Disapp.	8 18 3
II.	Transit	Ingress W.	1	11	36					I.	Eclipse	Reapp.	8 20 49 20.5
II.	Shadow	Ingress W.	1	12	29					I.	Transit	Ingress	9 15 13
II.	Transit	Egress W.	1	14	1					I.	Shadow	Ingress	9 15 50
II.	Shadow	Egress W.	1	14	59					I.	Transit	Egress	9 17 25
I.	Occult.	Disapp.	1	16	18					I.	Shadow	Egress	9 18 3
I.	Eclipse	Reapp.	1	18	55	14.6				II.	Occult.	Disapp. W.	10 8 10
I.	Transit	Ingress W.	2	13	27					II.	Eclipse	Reapp. W.	10 11 54 47.6
I.	Shadow	Ingress W.	2	13	55					I.	Occult.	Disapp. W.	10 12 29
I.	Transit	Egress	2	15	39					I.	Eclipse	Reapp.	10 15 17 51.8
I.	Shadow	Egress	2	16	8					I.	Transit	Ingress W.	11 9 39
II.	Occult.	Disapp.	3	5	53					I.	Shadow	Ingress W.	11 10 18
II.	Eclipse	Reapp. W.	3	9	18	16.8				I.	Transit	Egress W.	11 11 51
I.	Occult.	Disapp. W.	3	10	44					I.	Shadow	Egress W.	11 12 31
I.	Eclipse	Reapp. W.	3	13	23	44.1				III.	Transit	Ingress	11 19 3
I.	Transit	Ingress W.	4	7	53					III.	Transit	Egress	11 21 26
I.	Shadow	Ingress W.	4	8	23					III.	Shadow	Ingress	11 21 42
I.	Transit	Egress W.	4	10	5					III.	Shadow	Egress	12 0 12
I.	Shadow	Egress W.	4	10	36					II.	Transit	Ingress	12 2 58
III.	Transit	Ingress	4	15	42					II.	Shadow	Ingress	12 4 20
III.	Shadow	Ingress	4	17	43					II.	Transit	Egress	12 5 26
III.	Transit	Egress	4	18	0					II.	Shadow	Egress	12 6 50
III.	Shadow	Egress	4	20	13					I.	Occult.	Disapp.	12 6 55
II.	Transit	Ingress	5	0	42					I.	Eclipse	Reapp. W.	12 9 46 26 3
II.	Shadow	Ingress	5	1	46					I.	Transit	Ingress	13 4 5
II.	Transit	Egress	5	3	9					I.	Shadow	Ingress	13 4 47
II.	Shadow	Egress	5	4	16					I.	Transit	Egress	13 6 18
I.	Occult.	Disapp.	5	5	10					I.	Shadow	Egress	13 7 0
I.	Eclipse	Reapp. W.	5	7	52	17.5				II.	Occult.	Disapp.	13 21 20
I.	Transit	Ingress	6	2	19					II.	Eclipse	Reapp.	14 1 13 39.2
I.	Shadow	Ingress	6	2	52					I.	Occult.	Disapp.	14 1 21
I.	Transit	Egress	6	4	31					I.	Eclipse	Reapp.	14 4 14 59.1
I.	Shadow	Egress	6	5	5					I.	Transit	Ingress	14 22 32
II.	Occult.	Disapp.	6	19	1					I.	Shadow	Ingress	14 23 15
II.	Eclipse	Reapp.	6	22	37	1.2				I.	Transit	Egress	15 0 45
I.	Occult.	Disapp.	6	23	36					I.	Shadow	Egress	15 1 28
I.	Eclipse	Reapp.	7	2	20	48.6				III.	Occult.	Disapp. W.	15 8 54
I.	Transit	Ingress	7	20	46					III.	Occult.	Reapp. W.	15 11 18
I.	Shadow	Ingress	7	21	21					III.	Eclipse	Disapp. W.	15 11 58 14.0
I.	Transit	Egress	7	22	58					III.	Eclipse	Reapp. W.	15 14 13 14.2
I.	Shadow	Egress	7	23	34					II.	Transit	Ingress	15 16 6
III.	Occult.	Disapp.	8	5	32					II.	Shadow	Ingress	15 17 37
III.	Occult.	Reapp. W.	8	7	52					II.	Transit	Egress	15 18 35
III.	Eclipse	Disapp. W.	8	7	59	47.6				I.	Occult.	Disapp.	15 19 48
III.	Eclipse	Reapp. W.	8	10	15	38.8				II.	Shadow	Egress	15 20 7
II.	Transit	Ingress W.	8	13	50					I.	Eclipse	Reapp.	15 22 43 32.4
II.	Shadow	Ingress W.	8	15	3					I.	Transit	Ingress	16 16 59
II.	Transit	Egress	8	16	17					I.	Shadow	Ingress	16 17 44

448 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME.

MAY.

			d	h	m	s				d	h	m	s
I.	Transit	Egress	16	19	12		I.	Occult.	Disapp.	24	16	2	
I.	Shadow	Egress	16	19	57		II.	Eclipse	Reapp.	24	17	8	21.6
II.	Occult.	Disapp. W.	17	10	30		I.	Eclipse	Reapp.	24	19	6	23.2
I.	Occult.	Disapp. W.	17	14	15		I.	Transit	Ingress W.	25	13	14	
II.	Eclipse	Reapp. W.	17	14	31	30.6	I.	Shadow	Ingress W.	25	14	8	
I.	Eclipse	Reapp.	17	17	12	5.1	I.	Transit	Egress	25	15	27	
I.	Transit	Ingress W.	18	11	26		I.	Shadow	Egress	25	16	21	
I.	Shadow	Ingress W.	18	12	13		III.	Transit	Ingress	26	1	57	
I.	Transit	Egress W.	18	13	39		III.	Transit	Egress	26	4	26	
I.	Shadow	Egress W.	18	14	26		III.	Shadow	Ingress	26	5	41	
III.	Transit	Ingress	18	22	28		II.	Transit	Ingress	26	7	35	
III.	Transit	Egress	19	0	54		III.	Shadow	Egress W.	26	8	9	
III.	Shadow	Ingress	19	1	42		II.	Shadow	Ingress W.	26	9	29	
III.	Shadow	Egress	19	4	10		II.	Transit	Egress W.	26	10	4	
II.	Transit	Ingress	19	5	15		I.	Occult.	Disapp. W.	26	10	29	
II.	Shadow	Ingress	19	6	55		II.	Shadow	Egress W.	26	11	58	
II.	Transit	Egress	19	7	44		I.	Eclipse	Reapp. W.	26	13	34	59.6
I.	Occult.	Disapp. W.	19	8	42		I.	Transit	Ingress	27	7	41	
II.	Shadow	Egress W.	19	9	24		I.	Shadow	Ingress W.	27	8	37	
I.	Eclipse	Reapp. W.	19	11	40	40.3	I.	Transit	Egress W.	27	9	54	
I.	Transit	Ingress	20	5	53		I.	Shadow	Egress W.	27	10	50	
I.	Shadow	Ingress	20	6	42		II.	Occult.	Disapp.	28	2	3	
I.	Transit	Egress W.	20	8	6		I.	Occult.	Disapp.	28	4	56	
I.	Shadow	Egress W.	20	8	55		II.	Eclipse	Reapp.	28	6	27	23.4
II.	Occult.	Disapp.	20	23	41		I.	Eclipse	Reapp.	28	8	3	35.1
I.	Occult.	Disapp.	21	3	8		I.	Transit	Ingress	29	2	8	
II.	Eclipse	Reapp.	21	3	50	27.6	I.	Shadow	Ingress	29	3	6	
I.	Eclipse	Reapp.	21	6	9	24.8	I.	Transit	Egress	29	4	21	
I.	Transit	Ingress	22	0	20		I.	Shadow	Egress	29	5	19	
I.	Shadow	Ingress	22	1	10		III.	Occult.	Disapp.	29	15	50	
I.	Transit	Egress	22	2	33		III.	Occult.	Reapp.	29	18	21	
I.	Shadow	Egress	22	3	23		III.	Eclipse	Disapp.	29	19	55	53.9
III.	Occult.	Disapp. W.	22	12	20		II.	Transit	Ingress	29	20	45	
III.	Occult.	Reapp.	22	14	48		III.	Eclipse	Reapp.	29	22	9	13 5
III.	Eclipse	Disapp.	22	15	56	59.4	II.	Shadow	Ingress	29	22	46	
III.	Eclipse	Reapp.	22	18	11	9.0	II.	Transit	Egress	29	23	15	
II.	Transit	Ingress	22	18	25		I.	Occult.	Disapp.	29	23	23	
II.	Shadow	Ingress	22	20	12		II.	Shadow	Egress	30	1	15	
II.	Transit	Egress	22	20	54		I.	Eclipse	Reapp.	30	2	32	10.2
I.	Occult.	Disapp.	22	21	35		I.	Transit	Ingress	30	20	35	
II.	Shadow	Egress	22	22	41		I.	Shadow	Ingress	30	21	35	
I.	Eclipse	Reapp.	23	0	37	49.1	I.	Transit	Egress	30	22	48	
I.	Transit	Ingress	23	18	47		I.	Shadow	Egress	30	23	48	
I.	Shadow	Ingress	23	19	39		II.	Occult.	Disapp.	31	15	15	
I.	Transit	Egress	23	21	0		I.	Occult.	Disapp.	31	17	50	
I.	Shadow	Egress	23	21	52		II.	Eclipse	Reapp.	31	19	45	21.1
II.	Occult.	Disapp. W.	24	12	52		I.	Eclipse	Reapp.	31	21	0	45.5

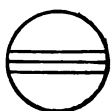
JUPITER'S SATELLITES, 1863. 449

WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



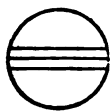
r *

III.



d r *

II.



r *

IV. *Not Eclipsed.*

JUNE.

			d	h	m	s				d	h	m	s
I.	Transit	Ingress	1	15	2			I.	Occult.	Disapp.	6	1	11
I.	Shadow	Ingress	1	16	3			II.	Shadow	Ingress	6	1	21
I.	Transit	Egress	1	17	15			II.	Transit	Egress	6	1	38
I.	Shadow	Egress	1	18	16			III.	Eclipse	Reapp.	6	2	8 0.8
III.	Transit	Ingress	2	5	29			II.	Shadow	Egress	6	3	49
III.	Transit	Egress	2	8	1			I.	Eclipse	Reapp.	6	4	26 36.8
III.	Shadow	Ingress W.	2	9	41			I.	Transit	Ingress	6	22	24
II.	Transit	Ingress W.	2	9	56			I.	Shadow	Ingress	6	23	30
II.	Shadow	Ingress W.	2	12	3			I.	Transit	Egress	7	0	37
III.	Shadow	Egress W.	2	12	7			I.	Shadow	Egress	7	1	43
I.	Occult.	Disapp. W.	2	12	17			II.	Occult.	Disapp.	7	17	42
II.	Transit	Egress W.	2	12	27			I.	Occult.	Disapp.	7	19	39
II.	Shadow	Egress	2	14	32			II.	Eclipse	Reapp.	7	22	22 27.1
I.	Eclipse	Reapp.	2	15	29 23.0			I.	Eclipse	Reapp.	7	22	55 12.4
I.	Transit	Ingress W.	3	9	29			I.	Transit	Ingress	8	16	52
I.	Shadow	Ingress W.	3	10	32			I.	Shadow	Ingress	8	17	59
I.	Transit	Egress W.	3	11	42			I.	Transit	Egress	8	19	5
I.	Shadow	Egress W.	3	12	45			I.	Shadow	Egress	8	20	12
II.	Occult.	Disapp.	4	4	28			III.	Transit	Ingress W.	9	9	6
I.	Occult.	Disapp.	4	6	44			III.	Transit	Egress W.	9	11	41
II.	Eclipse	Reapp. W.	4	9	4 27.0			II.	Transit	Ingress W.	9	12	20
I.	Eclipse	Reapp. W.	4	9	58 0.0			III.	Shadow	Ingress	9	13	40
I.	Transit	Ingress	5	3	56			I.	Occult.	Disapp.	9	14	7
I.	Shadow	Ingress	5	5	1			II.	Shadow	Ingress	9	14	38
I.	Transit	Egress	5	6	9			II.	Transit	Egress	9	14	50
I.	Shadow	Egress	5	7	14			III.	Shadow	Egress	9	16	6
III.	Occult.	Disapp.	5	19	24			II.	Shadow	Egress	9	17	6
III.	Occult.	Reapp.	5	21	58			I.	Eclipse	Reapp.	9	17	23 50.1
II.	Transit	Ingress	5	23	8			I.	Transit	Ingress W.	10	11	20
III.	Eclipse	Disapp.	5	23	55 30.6			I.	Shadow	Ingress W.	10	12	28

450 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME.

JUNE.

			d	h	m	s				d	h	m	s
I.	Transit	Egress	10	13	33			II.	Eclipse	Reapp.	18	14	18 48.0
I.	Shadow	Egress	10	14	41			I.	Transit	Ingress	19	7	40
II.	Occult.	Disapp.	11	6	55			I.	Shadow	Ingress W.	19	8	51
I.	Occult.	Disapp.	11	8	34			I.	Transit	Egress W.	19	9	53
II.	Eclipse	Reapp. W.	11	11	41	35.6		I.	Shadow	Egress W.	19	11	4
I.	Eclipse	Reapp. W.	11	11	52	28.3		III.	Occult.	Disapp.	20	2	48
I.	Transit	Ingress	12	5	48			II.	Transit	Ingress	20	4	0
I.	Shadow	Ingress	12	6	56			I.	Occult.	Disapp.	20	4	53
I.	Transit	Egress	12	8	1			III.	Occult.	Reapp.	20	5	26
I.	Shadow	Egress W.	12	9	9			II.	Shadow	Ingress	20	6	29
III.	Occult.	Disapp.	12	23	4			II.	Transit	Egress	20	6	32
II.	Transit	Ingress	13	1	32			III.	Eclipse	Disapp.	20	7	53 58.1
III.	Occult.	Reapp.	13	1	40			I.	Eclipse	Reapp. W.	20	8	15 37.4
I.	Occult.	Disapp.	13	3	1			II.	Shadow	Egress W.	20	8	57
III.	Eclipse	Disapp.	13	3	54	38.6		III.	Eclipse	Reapp. W.	20	10	4 51.1
II.	Shadow	Ingress	13	3	55			I.	Transit	Ingress	21	2	8
II.	Transit	Egress	13	4	4			I.	Shadow	Ingress	21	3	20
III.	Eclipse	Reapp.	13	6	6	19.8		I.	Transit	Egress	21	4	21
I.	Eclipse	Reapp.	13	6	21	5.2		I.	Shadow	Egress	21	5	33
II.	Shadow	Egress	13	6	23			II.	Occult.	Disapp.	21	22	41
I.	Transit	Ingress	14	0	16			I.	Occult.	Disapp.	21	23	21
I.	Shadow	Ingress	14	1	25			II.	Occult.	Reapp.	22	1	13
I.	Transit	Egress	14	2	29			II.	Eclipse	Disapp.	22	1	14 28 9
I.	Shadow	Egress	14	3	38			I.	Eclipse	Reapp.	22	2	44 15.1
II.	Occult.	Disapp.	14	20	10			II.	Eclipse	Reapp.	22	3	36 51.5
I.	Occult.	Disapp.	14	21	29			I.	Transit	Ingress	22	20	36
I.	Eclipse	Reapp.	15	0	49	42.3		I.	Shadow	Ingress	22	21	49
II.	Eclipse	Reapp.	15	0	50	37.6		I.	Transit	Egress	22	22	49
I.	Transit	Ingress	15	18	44			I.	Shadow	Egress	23	0	2
I.	Shadow	Ingress	15	19	53			III.	Transit	Ingress	23	16	35
I.	Transit	Egress	15	20	57			II.	Transit	Ingress	23	17	14
I.	Shadow	Egress	15	22	6			I.	Occult.	Disapp.	23	17	49
III.	Transit	Ingress	16	12	48			III.	Transit	Egress	23	19	13
II.	Transit	Ingress	16	14	46			II.	Transit	Egress	23	19	46
III.	Transit	Egress	16	15	25			II.	Shadow	Ingress	23	19	47
I.	Occult.	Disapp.	16	15	57			I.	Eclipse	Reapp.	23	21	12 54.1
II.	Shadow	Ingress	16	17	12			III.	Shadow	Ingress	23	21	39
II.	Transit	Egress	16	17	17			II.	Shadow	Egress	23	22	14
III.	Shadow	Ingress	16	17	40			III.	Shadow	Egress	24	0	3
I.	Eclipse	Reapp.	16	19	18	21.1		I.	Transit	Ingress	24	15	4
II.	Shadow	Egress	16	19	40			I.	Shadow	Ingress	24	16	18
III.	Shadow	Egress	16	20	5			I.	Transit	Egress	24	17	17
I.	Transit	Ingress	17	13	12			I.	Shadow	Egress	24	18	31
I.	Shadow	Ingress	17	14	22			II.	Occult.	Disapp.	25	11	57
I.	Transit	Egress	17	15	25			I.	Occult.	Disapp.	25	12	17
I.	Shadow	Egress	17	16	35			II.	Occult.	Reapp.	25	14	30
II.	Occult.	Disapp. W.	18	9	25			II.	Eclipse	Disapp.	25	14	33 49.3
I.	Occult.	Disapp. W.	18	10	26			I.	Eclipse	Reapp.	25	15	41 33.5
I.	Eclipse	Reapp.	18	13	47	0.9		II.	Eclipse	Reapp.	25	16	56 2.5

JUPITER'S SATELLITES, 1863. 451

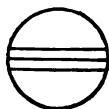
WASHINGTON MEAN TIME.

JUNE.

I. Transit	Ingress W.	d h m s	26 9 32	I. Occult.	Disapp.	d h m s	29 1 13
I. Shadow	Ingress W.	26 10 47		II. Occult.	Disapp.	29 1 14	
I. Transit	Egress W.	26 11 45		II. Occult.	Reapp.	29 3 46	
I. Shadow	Egress	26 13 0		II. Eclipse	Disapp.	29 3 52	2.8
II. Transit	Ingress	27 6 29		I. Eclipse	Reapp.	29 4 38	49.7
III. Occult.	Disapp.	27 6 37		II. Eclipse	Reapp.	29 6 14	6.6
I. Occult.	Disapp.	27 6 45		I. Transit	Ingress	29 22 28	
II. Transit	Egress W.	27 9 1		I. Shadow	Ingress	29 23 45	
II. Shadow	Ingress W.	27 9 4		I. Transit	Egress	30 0 42	
III. Occult.	Reapp. W.	27 9 16		I. Shadow	Egress	30 1 58	
I. Eclipse	Reapp. W.	27 10 10	11.3	I. Occult.	Disapp.	30 19 42	
II. Shadow	Egress W.	27 11 32		II. Transit	Ingress	30 19 44	
III. Eclipse	Disapp.	27 11 52	50.2	III. Transit	Ingress	30 20 26	
III. Eclipse	Reapp.	27 14 2	55.4	II. Transit	Egress	30 22 17	
I. Transit	Ingress	28 4 0		II. Shadow	Ingress	30 22 21	
I. Shadow	Ingress	28 5 16		III. Transit	Egress	30 23 6	
I. Transit	Egress	28 6 13		I. Eclipse	Reapp.	30 23 7	29.1
I. Shadow	Egress	28 7 29					

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



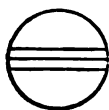
r *

III.



d r
* *

II.



r *

IV. *Not Eclipsed.*

JULY.

II. Shadow	Egress	d h m s	1 0 49	I. Eclipse	Reapp.	d h m s	2 17 36 9.3
III. Shadow	Ingress	1 1 39		II. Eclipse	Reapp.	2 19 34	17.4
III. Shadow	Egress	1 4 3		I. Transit	Ingress	3 11 25	
I. Transit	Ingress	1 16 57		I. Shadow	Ingress	3 12 42	
I. Shadow	Ingress	1 18 13		I. Transit	Egress	3 13 39	
I. Transit	Egress	1 19 11		I. Shadow	Egress	3 14 55	
I. Shadow	Egress	1 20 26		I. Occult.	Disapp. W.	4 8 38	
I. Occult.	Disapp.	2 14 10		II. Transit	Ingress W.	4 9 0	
II. Occult.	Disapp.	2 14 31		III. Occult.	Disapp. W.	4 10 29	
II. Occult.	Reapp.	2 17 4		II. Transit	Egress	4 11 33	
II. Eclipse	Disapp.	2 17 11	23.0	II. Shadow	Ingress	4 11 39	

452 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME.

JULY.

I.	Eclipse	Reapp.	d	h	m	s	II.	Shadow	Egress	d	h	m	s		
III.	Occult.	Reapp.	4	12	4	47.5	III.	Occult.	Reapp.	11	16	40			
II.	Shadow	Egress	4	13	10		III.	Eclipse	Disapp.	11	17	8			
III.	Eclipse	Disapp.	4	14	6		III.	Eclipse	Reapp.	11	19	50	44.8		
III.	Eclipse	Reapp.	4	15	51	39.3	III.	Eclipse	Reapp.	11	21	59	16.2		
III.	Eclipse	Reapp.	4	18	0	57.3	I.	Transit	Ingress	12	7	50			
I.	Transit	Ingress	5	5	54		I.	Shadow	Ingress	W.	12	9	6		
I.	Shadow	Ingress	5	7	11		I.	Transit	Egress	W.	12	10	4		
I.	Transit	Egress	W.	5	8	8	I.	Shadow	Egress		12	11	19		
I.	Shadow	Egress	W.	5	9	24	I.	Occult.	Disapp.		13	5	1		
I.	Occult.	Disapp.		6	3	6	II.	Occult.	Disapp.		13	6	26		
II.	Occult.	Disapp.		6	3	49	I.	Eclipse	Reapp.	W.	13	8	28	4.1	
II.	Occult.	Reapp.		6	6	22	II.	Occult.	Reapp.	W.	13	9	0		
II.	Eclipse	Disapp.		6	6	29	36.8	II.	Eclipse	Disapp.	W.	13	9	17	8.8
I.	Eclipse	Reapp.		6	6	33	26.5	II.	Eclipse	Reapp.		13	11	38	35.0
II.	Eclipse	Reapp.	W.	6	8	51	21.8	I.	Transit	Ingress		14	2	19	
I.	Transit	Ingress		7	0	23		I.	Shadow	Ingress		14	3	35	
I.	Shadow	Ingress		7	1	40		I.	Transit	Egress		14	4	33	
I.	Transit	Egress		7	2	37		I.	Shadow	Egress		14	5	48	
I.	Shadow	Egress		7	3	53		I.	Occult.	Disapp.		14	23	30	
I.	Occult.	Disapp.		7	21	35		II.	Transit	Ingress		15	0	52	
II.	Transit	Ingress		7	22	17		I.	Eclipse	Reapp.		15	2	56	44.3
III.	Transit	Ingress		8	0	22		II.	Transit	Egress		15	3	25	
II.	Transit	Egress		8	0	50		II.	Shadow	Ingress		15	3	30	
II.	Shadow	Ingress		8	0	56		III.	Transit	Ingress		15	4	22	
I.	Eclipse	Reapp.		8	1	2	5.7	II.	Shadow	Egress		15	5	57	
III.	Transit	Egress		8	3	3		III.	Transit	Egress		15	7	4	
II.	Shadow	Egress		8	3	23		III.	Shadow	Ingress	W.	15	9	39	
III.	Shadow	Ingress		8	5	39		III.	Shadow	Egress		15	12	1	
III.	Shadow	Egress	W.	8	8	2		I.	Transit	Ingress		15	20	48	
I.	Transit	Ingress		8	18	52		I.	Shadow	Ingress		15	22	4	
I.	Shadow	Ingress		8	20	9		I.	Transit	Egress		15	23	2	
I.	Transit	Egress		8	21	6		I.	Shadow	Egress		16	0	17	
I.	Shadow	Egress		8	22	22		I.	Occult.	Disapp.		16	17	59	
I.	Occult.	Disapp.		9	16	4		II.	Occult.	Disapp.		16	19	45	
II.	Occult.	Disapp.		9	17	7		I.	Eclipse	Reapp.		16	21	25	24.4
I.	Eclipse	Reapp.		9	19	30	46.4	II.	Occult.	Reapp.		16	22	19	
II.	Occult.	Reapp.		9	19	41		II.	Eclipse	Disapp.		16	22	36	24.9
II.	Eclipse	Disapp.		9	19	48	55.4	II.	Eclipse	Reapp.		17	0	57	41.7
II.	Eclipse	Reapp.		9	22	10	31.0	I.	Transit	Ingress		17	15	17	
I.	Transit	Ingress		10	13	21		I.	Shadow	Ingress		17	16	33	
I.	Shadow	Ingress		10	14	38		I.	Transit	Egress		17	17	31	
I.	Transit	Egress		10	15	35		I.	Shadow	Egress		17	18	46	
I.	Shadow	Egress		10	16	51		I.	Occult.	Disapp.		18	12	28	
I.	Occult.	Disapp.	W.	11	10	33		II.	Transit	Ingress		18	14	10	
II.	Transit	Ingress		11	11	34		I.	Eclipse	Reapp.		18	15	54	2.8
I.	Eclipse	Reapp.		11	13	59	25.0	II.	Transit	Egress		18	16	44	
II.	Transit	Egress		11	14	7		II.	Shadow	Ingress		18	16	48	
II.	Shadow	Ingress		11	14	13		III.	Occult.	Disapp.		18	18	27	
III.	Occult.	Disapp.		11	14	26		II.	Shadow	Egress		18	19	15	

JUPITER'S SATELLITES, 1863. 453

WASHINGTON MEAN TIME.

JULY.

			d	h	m	s				d	h	m	s		
III.	Occult.	Reapp.	18	21	9					II.	Shadow	Ingress	25	19	23
III.	Eclipse	Disapp.	18	23	49	54.5				II.	Shadow	Egress	25	21	49
III.	Eclipse	Reapp.	19	1	57	39.9				III.	Occult.	Disapp.	25	22	32
I.	Transit	Ingress	W.	19	9	46				III.	Occult.	Reapp.	26	1	15
I.	Shadow	Ingress		19	11	2				III.	Eclipse	Disapp.	26	3	49 41 5
I.	Transit	Egress		19	12	0				III.	Eclipse	Reapp.	26	5	56 41 9
I.	Shadow	Egress		19	13	15				I.	Transit	Ingress	26	11	42
I.	Occult.	Disapp.		20	6	57				I.	Shadow	Ingress	26	12	57
II.	Occult.	Disapp.	W.	20	9	5				I.	Transit	Egress	26	13	56
I.	Eclipse	Reapp.	W.	20	10	22 42.1				I.	Shadow	Egress	26	15	10
II.	Occult.	Reapp.		20	11	39				I.	Occult.	Disapp.	W.	27	8 53
II.	Eclipse	Disapp.		20	11	44 37.5				II.	Occult.	Disapp.		27	11 46
II.	Eclipse	Reapp.		20	14	5 44.9				I.	Eclipse	Reapp.		27	12 17 20.4
I.	Transit	Ingress		21	4	15				II.	Occult.	Reapp.		27	14 19
I.	Shadow	Ingress		21	5	31				II.	Eclipse	Disapp.		27	14 22 1.0
I.	Transit	Egress		21	6	29				II.	Eclipse	Reapp.		27	16 42 49.2
I.	Shadow	Egress		21	7	44				I.	Transit	Ingress		28	6 11
I.	Occult.	Disapp.		22	1	26				I.	Shadow	Ingress		28	7 26
II.	Transit	Ingress		22	3	29				I.	Transit	Egress	W.	28	8 25
I.	Eclipse	Reapp.		22	4	51 21.3				I.	Shadow	Egress	W.	28	9 39
II.	Transit	Egress		22	6	2				I.	Occult.	Disapp.		29	3 22
II.	Shadow	Ingress		22	6	5				II.	Transit	Ingress		29	6 8
III.	Transit	Ingress	W.	22	8	24				I.	Eclipse	Reapp.		29	6 45 59.3
II.	Shadow	Egress	W.	22	8	32				II.	Shadow	Ingress	W.	29	8 40
III.	Transit	Egress		22	11	7				II.	Transit	Egress	W.	29	8 41
III.	Shadow	Ingress		22	13	38				II.	Shadow	Egress		29	11 7
III.	Shadow	Egress		22	16	0				III.	Transit	Ingress		29	12 30
I.	Transit	Ingress		22	22	44				III.	Transit	Egress		29	15 13
I.	Shadow	Ingress		22	23	59				III.	Shadow	Ingress		29	17 37
I.	Transit	Egress		23	0	58				III.	Shadow	Egress		29	19 58
I.	Shadow	Egress		23	2	12				I.	Transit	Ingress		30	0 41
I.	Occult.	Disapp.		23	19	55				I.	Shadow	Ingress		30	1 55
II.	Occult.	Disapp.		23	22	26				I.	Transit	Egress		30	2 55
I.	Eclipse	Reapp.		23	23	20 2.4				I.	Shadow	Egress		30	4 8
II.	Occult.	Reapp.		24	1	0				I.	Occult.	Disapp.		30	21 51
II.	Eclipse	Disapp.		24	1	3 50.2				II.	Occult.	Disapp.		31	1 7
II.	Eclipse	Reapp.		24	3	24 48.0				I.	Eclipse	Reapp.		31	1 14 41.0
I.	Transit	Ingress		24	17	13				II.	Occult.	Reapp.		31	3 40
I.	Shadow	Ingress		24	18	28				II.	Eclipse	Disapp.		31	3 41 9.4
I.	Transit	Egress		24	19	27				II.	Eclipse	Reapp.		31	6 1 48.2
I.	Shadow	Egress		24	20	41				I.	Transit	Ingress		31	19 10
I.	Occult.	Disapp.		25	14	24				I.	Shadow	Ingress		31	20 24
II.	Transit	Ingress		25	16	48				I.	Transit	Egress		31	21 24
I.	Eclipse	Reapp.		25	17	48 40.6				I.	Shadow	Egress		31	22 37
II.	Transit	Egress		25	19	21									

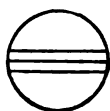
454 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME.

JULY.

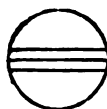
Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



r

III.



d

r

II.



d

r

IV. *Not Eclipsed.*

AUGUST.

			d	h	m	s				d	h	m	s
I.	Occult.	Disapp.	1	16	21		III.	Shadow	Ingress	5	21	37	
II.	Transit	Ingress	1	19	27		III.	Shadow	Egress	5	23	57	
I.	Eclipse	Reapp.	1	19	43	19.4	I.	Transit	Ingress	6	2	39	
II.	Shadow	Ingress	1	21	58		I.	Shadow	Ingress	6	3	50	
II.	Transit	Egress	1	22	1		I.	Transit	Egress	6	4	53	
II.	Shadow	Egress	2	0	24		I.	Shadow	Egress	6	6	3	
III.	Occult.	Disapp.	2	2	40		I.	Occult.	Disapp.	6	23	48	
III.	Occult.	Reapp.	2	5	23		I.	Eclipse	Reapp.	7	3	9	19.4
III.	Eclipse	Disapp.	2	7	48	54.8	II.	Occult.	Disapp.	7	3	50	
III.	Eclipse	Reapp.	2	9	55	11.0	II.	Eclipse	Reapp.	7	8	38	42.1
I.	Transit	Ingress	2	13	40		I.	Transit	Ingress	7	21	8	
I.	Shadow	Ingress	2	14	52		I.	Shadow	Ingress	7	22	19	
I.	Transit	Egress	2	15	54		I.	Transit	Egress	7	23	22	
I.	Shadow	Egress	2	17	5		I.	Shadow	Egress	8	0	32	
I.	Occult.	Disapp.	3	10	50		I.	Occult.	Disapp.	8	18	17	
I.	Eclipse	Reapp.	3	14	11	59.2	I.	Eclipse	Reapp.	8	21	37	57.3
II.	Occult.	Disapp.	3	14	28		II.	Transit	Ingress	8	22	9	
II.	Eclipse	Reapp.	3	19	19	47.8	II.	Shadow	Ingress	9	0	33	
I.	Transit	Ingress	4	8	9		II.	Transit	Egress	9	0	42	
I.	Shadow	Ingress	4	9	21		II.	Shadow	Egress	9	3	0	
I.	Transit	Egress	4	10	23		III.	Occult.	Disapp.	9	6	50	
I.	Shadow	Egress	4	11	34		III.	Occult.	Reapp.	9	9	33	
I.	Occult.	Disapp.	5	5	19		III.	Eclipse	Disapp.	9	11	48	14.1
I.	Eclipse	Reapp.	5	8	40	37.7	III.	Eclipse	Reapp.	9	13	53	46.9
II.	Transit	Ingress	5	8	48		I.	Transit	Ingress	9	15	38	
II.	Shadow	Ingress	5	11	15		I.	Shadow	Ingress	9	16	48	
II.	Transit	Egress	5	11	21		I.	Transit	Egress	9	17	52	
II.	Shadow	Egress	5	13	41		I.	Shadow	Egress	9	19	1	
III.	Transit	Ingress	5	16	41		I.	Occult.	Disapp.	10	12	47	
III.	Transit	Egress	5	19	24		I.	Eclipse	Reapp.	10	16	6	36.9

JUPITER'S SATELLITES, 1863. 455

WASHINGTON MEAN TIME.

AUGUST.

			d	h	m	s				d	h	m	s
II.	Occult.	Disapp.	10	17	12		I.	Shadow	Egress	18	15	25	
II.	Eclipse	Reapp.	10	21	56	39.2	I.	Occult.	Disapp.	19	9	16	
I.	Transit	Ingress	11	10	7		I.	Eclipse	Reapp.	19	12	29	51.8
I.	Shadow	Ingress	11	11	17		II.	Transit	Ingress	19	14	13	
I.	Transit	Egress	11	12	21		II.	Shadow	Ingress	19	16	25	
I.	Shadow	Egress	11	13	30		II.	Transit	Egress	19	16	46	
I.	Occult.	Disapp.	12	7	17		II.	Shadow	Egress	19	18	51	
I.	Eclipse	Reapp.	12	10	35	15.1	III.	Transit	Ingress	20	1	10	
II.	Transit	Ingress	12	11	30		III.	Transit	Egress	20	3	52	
II.	Shadow	Ingress	12	13	50		III.	Shadow	Ingress	20	5	36	
II.	Transit	Egress	12	14	3		I.	Transit	Ingress	20	6	36	
II.	Shadow	Egress	12	16	16		I.	Shadow	Ingress	W.	20	7	41
III.	Transit	Ingress	12	20	54		III.	Shadow	Egress	W.	20	7	55
III.	Transit	Egress	12	23	36		I.	Transit	Egress	20	8	50	
III.	Shadow	Ingress	13	1	36		I.	Shadow	Egress	20	9	54	
III.	Shadow	Egress	13	3	56		I.	Occult.	Disapp.	21	3	46	
I.	Transit	Ingress	13	4	37		I.	Eclipse	Reapp.	21	6	58	33.3
I.	Shadow	Ingress	13	5	45		II.	Occult.	Disapp.	21	9	20	
I.	Transit	Egress	13	6	51		II.	Eclipse	Reapp.	21	13	53	3.3
I.	Shadow	Egress	13	7	58		I.	Transit	Ingress	22	1	6	
I.	Occult.	Disapp.	14	1	46		I.	Shadow	Ingress	22	2	9	
I.	Eclipse	Reapp.	14	5	3	56.7	I.	Transit	Egress	22	3	20	
II.	Occult.	Disapp.	14	6	34		I.	Shadow	Egress	22	4	22	
II.	Eclipse	Reapp.	14	11	15	27.2	I.	Occult.	Disapp.	22	22	16	
I.	Transit	Ingress	14	23	7		I.	Eclipse	Reapp.	23	1	27	10.4
I.	Shadow	Ingress	15	0	14		II.	Transit	Ingress	23	3	35	
I.	Transit	Egress	15	1	21		II.	Shadow	Ingress	23	5	43	
I.	Shadow	Egress	15	2	27		II.	Transit	Egress	23	6	8	
I.	Occult.	Disapp.	15	20	16		II.	Shadow	Egress	W.	23	8	8
I.	Eclipse	Reapp.	15	23	32	34.6	III.	Occult.	Disapp.	23	15	21	
II.	Transit	Ingress	16	0	51		III.	Occult.	Reapp.	23	18	3	
II.	Shadow	Ingress	16	3	7		I.	Transit	Ingress	23	19	36	
II.	Transit	Egress	16	3	24		III.	Eclipse	Disapp.	23	19	45	46.3
II.	Shadow	Egress	16	5	33		I.	Shadow	Ingress	23	20	37	
III.	Occult.	Disapp.	16	11	5		I.	Transit	Egress	23	21	50	
III.	Occult.	Reapp.	16	13	48		III.	Eclipse	Reapp.	23	21	49	54.9
III.	Eclipse	Disapp.	16	15	47	3.1	I.	Shadow	Egress	23	22	50	
I.	Transit	Ingress	16	17	36		I.	Occult.	Disapp.	24	16	46	
III.	Eclipse	Reapp.	16	17	51	53.3	I.	Eclipse	Reapp.	24	19	55	49.8
I.	Shadow	Ingress	16	18	43		II.	Occult.	Disapp.	24	22	43	
I.	Transit	Egress	16	19	50		II.	Eclipse	Reapp.	25	3	11	54.8
I.	Shadow	Egress	16	20	56		I.	Transit	Ingress	25	14	6	
I.	Occult.	Disapp.	17	14	46		I.	Shadow	Ingress	25	15	6	
I.	Eclipse	Reapp.	17	18	1	14.1	I.	Transit	Egress	25	16	20	
II.	Occult.	Disapp.	17	19	57		I.	Shadow	Egress	25	17	19	
II.	Eclipse	Reapp.	18	0	33	21.7	I.	Occult.	Disapp.	26	11	16	
I.	Transit	Ingress	18	12	6		I.	Eclipse	Reapp.	26	14	24	27.1
I.	Shadow	Ingress	18	13	12		II.	Transit	Ingress	26	16	57	
I.	Transit	Egress	18	14	20		II.	Shadow	Ingress	26	19	0	

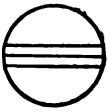
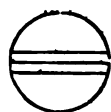
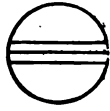
456 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME.

AUGUST.

II. Transit	Egress	d h m s	26 19 30	I. Shadow	Egress	d h m s	29 6 17
II. Shadow	Egress		26 21 26	I. Occult.	Disapp.		30 0 16
III. Transit	Ingress		27 5 27	I. Eclipse	Reapp.		30 3 21 45.5
III. Transit	Egress W.		27 8 8	II. Transit	Ingress		30 6 20
I. Transit	Ingress W.		27 8 36	II. Shadow	Ingress		30 8 18
III. Shadow	Ingress		27 9 34	II. Transit	Egress		30 8 53
I. Shadow	Ingress		27 9 35	II. Shadow	Egress		30 10 43
I. Transit	Egress		27 10 50	III. Occult.	Disapp.		30 19 40
I. Shadow	Egress		27 11 48	I. Transit	Ingress		30 21 36
III. Shadow	Egress		27 11 53	III. Occult.	Reapp.		30 22 21
I. Occult.	Disapp.		28 5 46	I. Shadow	Ingress		30 22 33
I. Eclipse	Reapp.		28 8 53 8.5	III. Eclipse	Disapp.		30 23 44 44.1
II. Occult.	Disapp.		28 12 6	I. Transit	Egress		30 23 50
II. Eclipse	Reapp.		28 16 31 29.0	I. Shadow	Egress		31 0 46
I. Transit	Ingress		29 3 6	III. Eclipse	Reapp.		31 1 48 12.3
I. Shadow	Ingress		29 4 4	I. Occult.	Disapp.		31 18 46
I. Transit	Egress		29 5 20	I. Eclipse	Reapp.		31 21 50 24.3

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 	III. 
II. 	IV. <i>Not Eclipsed.</i>

SEPTEMBER.

II. Occult.	Disapp.	d h m s	1 1 30	III. Transit	Ingress	d h m s	3 9 48
II. Eclipse	Reapp.		1 5 46 17.1	I. Transit	Ingress		3 10 36
I. Transit	Ingress		1 16 6	I. Shadow	Ingress		3 11 29
I. Shadow	Ingress		1 17 1	III. Transit	Egress		3 12 29
I. Transit	Egress		1 18 20	I. Transit	Egress		3 12 50
I. Shadow	Egress		1 19 14	III. Shadow	Ingress		3 13 35
I. Occult.	Disapp.		2 13 15	I. Shadow	Egress		3 13 42
I. Eclipse	Reapp.		2 16 19 0.8	III. Shadow	Egress		3 15 53
II. Transit	Ingress		2 19 43	I. Occult.	Disapp.		4 7 45
II. Shadow	Ingress		2 21 35	I. Eclipse	Reapp.		4 10 47 42.0
II. Transit	Egress		2 22 16	II. Occult.	Disapp.		4 14 54
II. Shadow	Egress		3 0 0	II. Eclipse	Reapp.		4 19 4 44.0

JUPITER'S SATELLITES, 1863. 457

WASHINGTON MEAN TIME.

SEPTEMBER.

		d	h	m	s			d	h	m	s
I.	Transit	Ingress	5	5	6	I.	Eclipse	Reapp.	13	7	10 49.1
I.	Shadow	Ingress	5	5	58	II.	Transit	Ingress	13	11	54
I.	Transit	Egress W.	5	7	20	II.	Shadow	Ingress	13	13	28
I.	Shadow	Egress	5	8	11	II.	Transit	Egress	13	14	25
I.	Occult.	Disapp.	6	2	15	II.	Shadow	Egress	13	15	53
I.	Eclipse	Reapp.	6	5	16 18.4	I.	Transit	Ingress	14	1	36
II.	Transit	Ingress	6	9	6	I.	Shadow	Ingress	14	2	21
II.	Shadow	Ingress	6	10	53	I.	Transit	Egress	14	3	50
II.	Transit	Egress	6	11	30	III.	Occult.	Disapp.	14	4	24
II.	Shadow	Egress	6	13	18	I.	Shadow	Egress	14	4	34
I.	Transit	Ingress	6	23	36	III.	Occult.	Reapp.	14	7	3
III.	Occult.	Disapp.	7	0	1	III.	Eclipse	Disapp.	14	7	43 13.5
I.	Shadow	Ingress	7	0	27	III.	Eclipse	Reapp.	14	9	45 23.3
I.	Transit	Egress	7	1	50	I.	Occult.	Disapp.	14	22	45
I.	Shadow	Egress	7	2	40	I.	Eclipse	Reapp.	15	1	39 27.6
III.	Occult.	Reapp.	7	2	41	II.	Occult.	Disapp.	15	7	6
III.	Eclipse	Disapp.	7	3	43 41.6	II.	Eclipse	Reapp.	15	10	58 27.2
III.	Eclipse	Reapp.	7	5	46 30.0	I.	Transit	Ingress	15	20	6
I.	Occult.	Disapp.	7	20	45	I.	Shadow	Ingress	15	20	50
I.	Eclipse	Reapp.	7	23	44 57.0	I.	Transit	Egress	15	22	20
II.	Occult.	Disapp.	8	4	17	I.	Shadow	Egress	15	23	3
II.	Eclipse	Reapp.	8	8	22 28.2	I.	Occult.	Disapp.	16	17	15
I.	Transit	Ingress	8	18	6	I.	Eclipse	Reapp.	16	20	8 2.6
I.	Shadow	Ingress	8	18	56	II.	Transit	Ingress	17	1	18
I.	Transit	Egress	8	20	20	II.	Shadow	Ingress	17	2	46
I.	Shadow	Egress	8	21	9	II.	Transit	Egress	17	3	49
I.	Occult.	Disapp.	9	15	15	II.	Shadow	Egress	17	5	11
I.	Eclipse	Reapp.	9	18	13 32.9	I.	Transit	Ingress	17	14	37
II.	Transit	Ingress	9	22	30	I.	Shadow	Ingress	17	15	19
II.	Shadow	Ingress	10	0	10	I.	Transit	Egress	17	16	51
II.	Transit	Egress	10	1	2	I.	Shadow	Egress	17	17	32
II.	Shadow	Egress	10	2	35	III.	Transit	Ingress	17	18	33
I.	Transit	Ingress	10	12	36	III.	Transit	Egress	17	21	11
I.	Shadow	Ingress	10	13	25	III.	Shadow	Ingress	17	21	32
III.	Transit	Ingress	10	14	10	III.	Shadow	Egress	17	23	49
I.	Transit	Egress	10	14	50	I.	Occult.	Disapp.	18	11	45
I.	Shadow	Egress	10	15	38	I.	Eclipse	Reapp.	18	14	36 42.9
III.	Transit	Egress	10	16	49	II.	Occult.	Disapp.	18	20	30
III.	Shadow	Ingress	10	17	33	II.	Eclipse	Reapp.	19	0	17 37.8
III.	Shadow	Egress	10	19	51	I.	Transit	Ingress	19	9	7
I.	Occult.	Disapp.	11	9	45	I.	Shadow	Ingress	19	9	48
I.	Eclipse	Reapp.	11	12	42 13.5	I.	Transit	Egress	19	11	21
II.	Occult.	Disapp.	11	17	42	I.	Shadow	Egress	19	12	1
II.	Eclipse	Reapp.	11	21	40 47.0	I.	Occult.	Disapp.	20	6	15
I.	Transit	Ingress	12	7	6	I.	Eclipse	Reapp.	20	9	5 17.9
I.	Shadow	Ingress	12	7	53	II.	Transit	Ingress	20	14	42
I.	Transit	Egress	12	9	20	II.	Shadow	Ingress	20	16	4
I.	Shadow	Egress	12	10	6	II.	Transit	Egress	20	17	13
I.	Occult.	Disapp.	13	4	15	II.	Shadow	Egress	20	18	28

458 JUPITER'S SATELLITES, 1863.

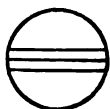
WASHINGTON MEAN TIME.

SEPTEMBER.

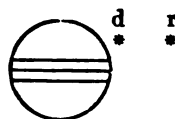
		d	h	m	s			d	h	m	s
I.	Transit	Ingress	21	3	37	I.	Occult.	Disapp.	25	13	46
I.	Shadow	Ingress	21	4	17	I.	Eclipse	Reapp.	25	16	31 9.4
I.	Transit	Egress	21	5	51	II.	Occult.	Disapp.	25	23	19
I.	Shadow	Egress	21	6	30	II.	Eclipse	Reapp.	26	2	53 15.8
III.	Occult.	Disapp.	21	8	49	I.	Transit	Ingress	26	11	8
III.	Occult.	Reapp.	21	11	26	I.	Shadow	Ingress	26	11	42
III.	Eclipse	Disapp.	21	11	41 7.9	I.	Transit	Egress	26	13	22
III.	Eclipse	Reapp.	21	13	43 40.1	I.	Shadow	Egress	26	13	55
I.	Occult.	Disapp.	22	0	46	I.	Occult.	Disapp.	27	8	17
I.	Eclipse	Reapp.	22	3	33 55.4	I.	Eclipse	Reapp.	27	10	59 43.6
II.	Occult.	Disapp.	22	9	54	II.	Transit	Ingress	27	17	30
II.	Eclipse	Reapp.	22	13	35 13.8	II.	Shadow	Ingress	27	18	39
I.	Transit	Ingress	22	22	7	II.	Transit	Egress	27	20	1
I.	Shadow	Ingress	22	22	45	II.	Shadow	Egress	27	21	3
I.	Transit	Egress	23	0	21	I.	Transit	Ingress	28	5	38
I.	Shadow	Egress	23	0	58	I.	Shadow	Ingress	28	6	11
I.	Occult.	Disapp.	23	19	16	I.	Transit	Egress	28	7	52
I.	Eclipse	Reapp.	23	22	2 29.8	I.	Shadow	Egress	28	8	24
II.	Transit	Ingress	24	4	6	III.	Occult.	Disapp.	28	13	15
II.	Shadow	Ingress	24	5	21	III.	Eclipse	Reapp.	28	17	42 0.6
II.	Transit	Egress	24	6	37	I.	Occult.	Disapp.	29	2	47
II.	Shadow	Egress	24	7	46	I.	Eclipse	Reapp.	29	5	28 20.8
I.	Transit	Ingress	24	16	38	II.	Occult.	Disapp.	29	12	44
I.	Shadow	Ingress	24	17	13	II.	Eclipse	Reapp.	29	15	59 47.6
I.	Transit	Egress	24	18	52	I.	Transit	Ingress	30	0	8
I.	Shadow	Egress	24	19	26	I.	Shadow	Ingress	30	0	39
III.	Transit	Ingress	24	22	58	I.	Transit	Egress	30	2	22
III.	Shadow	Ingress	25	1	30	I.	Shadow	Egress	30	2	52
III.	Transit	Egress	25	1	35	I.	Occult.	Disapp.	30	21	17
III.	Shadow	Egress	25	3	47	I.	Eclipse	Reapp.	30	23	56 53.9

Phases of the Eclipses of the Satellites for an Inverting Telescope.

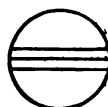
I.



III.



II.



IV. *Not Eclipsed.*

JUPITER'S SATELLITES, 1863. 459

WASHINGTON MEAN TIME.

The Satellites are not visible from September 30th to December 1st, Jupiter being too near the Sun.

DECEMBER.

		d	h	m	s			d	h	m	s
I. Shadow	Egress	1	1	28		I. Transit	Egress	8	3	58	
I. Transit	Egress	1	1	59		I. Eclipse	Disapp.	8	22	21	49.8
I. Eclipse	Disapp.	1	20	27	59.3	I. Occult.	Reapp.	9	1	10	
I. Occult.	Reapp.	1	23	10		III. Eclipse	Disapp.	9	7	24	31.0
III. Eclipse	Disapp.	2	3	26	28.0	III. Eclipse	Reapp.	9	9	20	28.2
III. Eclipse	Reapp.	2	5	22	49.2	III. Occult.	Disapp.	9	9	51	
III. Occult.	Disapp.	2	5	25		III. Occult.	Reapp.	9	12	6	
III. Occult.	Reapp.	2	7	43		II. Eclipse	Disapp.	9	15	39	43.3
II. Eclipse	Disapp.	2	13	4	41.4	II. Occult.	Reapp.	9	19	14	
II. Occult.	Reapp.	2	16	28		I. Shadow	Ingress	9	19	38	
I. Shadow	Ingress W.	2	17	44		I. Transit	Ingress	9	20	16	
I. Transit	Ingress W.	2	18	16		I. Shadow	Egress	9	21	50	
I. Shadow	Egress	2	19	56		I. Transit	Egress	9	22	28	
I. Transit	Egress	2	20	29		I. Eclipse	Disapp.	10	16	50	12.8
I. Eclipse	Disapp.	3	14	56	23.2	I. Occult.	Reapp.	10	19	40	
I. Occult.	Reapp. W.	3	17	40		II. Shadow	Ingress	11	9	56	
II. Shadow	Ingress	4	7	20		II. Transit	Ingress	11	11	15	
II. Transit	Ingress	4	8	26		II. Shadow	Egress	11	12	18	
II. Shadow	Egress	4	9	42		II. Transit	Egress	11	13	39	
II. Transit	Egress	4	10	50		I. Shadow	Ingress	11	14	6	
I. Shadow	Ingress	4	12	13		I. Transit	Ingress	11	14	46	
I. Transit	Ingress	4	12	46		I. Shadow	Egress	11	16	18	
I. Shadow	Egress	4	14	25		I. Transit	Egress	11	16	58	
I. Transit	Egress	4	14	59		I. Eclipse	Disapp.	12	11	18	43.1
I. Eclipse	Disapp.	5	9	24	54.6	I. Occult.	Reapp.	12	14	10	
I. Occult.	Reapp.	5	12	10		III. Shadow	Ingress	12	21	13	
III. Shadow	Ingress	5	17	15		III. Shadow	Egress	12	23	24	
III. Shadow	Egress	5	19	26		III. Transit	Ingress	13	0	0	
III. Transit	Ingress	5	19	36		III. Transit	Egress	13	2	14	
III. Transit	Egress	5	21	52		II. Eclipse	Disapp.	13	4	56	39.4
II. Eclipse	Disapp.	6	2	21	43.3	I. Shadow	Ingress	13	8	34	
II. Occult.	Reapp.	6	5	51		II. Occult.	Reapp.	13	8	37	
I. Shadow	Ingress	6	6	42		I. Transit	Ingress	13	9	16	
I. Transit	Ingress	6	7	16		I. Shadow	Egress	13	10	46	
I. Shadow	Egress	6	8	54		I. Transit	Egress	13	11	28	
I. Transit	Egress	6	9	28		I. Eclipse	Disapp.	14	5	47	7.4
I. Eclipse	Disapp.	7	3	53	19.7	I. Occult.	Reapp.	14	8	40	
I. Occult.	Reapp.	7	6	40		II. Shadow	Ingress	14	23	14	
II. Shadow	Ingress	7	20	38		II. Transit	Ingress	15	0	39	
II. Transit	Ingress	7	21	50		II. Shadow	Egress	15	1	36	
II. Shadow	Egress	7	23	0		II. Transit	Egress	15	3	2	
II. Transit	Egress	8	0	14		I. Shadow	Ingress	15	3	3	
I. Shadow	Ingress	8	1	10		I. Transit	Ingress	15	3	46	
I. Transit	Ingress	8	1	46		I. Shadow	Egress	15	5	15	
I. Shadow	Egress	8	3	22		I. Transit	Egress	15	5	58	

460 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME.

DECEMBER.

			^d ^h ^m ^s			^d ^h ^m ^s
I.	Eclipse	Disapp.	16 0 15 29.8	III.	Occult.	Disapp. W. 23 18 38
I.	Occult.	Reapp.	16 3 10	II.	Eclipse	Disapp. 23 20 46 16.4
III.	Eclipse	Disapp.	16 11 22 30.8	III.	Occult.	Reapp. 23 20 49
III.	Eclipse	Reapp.	16 13 18 5.2	I.	Shadow	Ingress 23 23 24
III.	Occult.	Disapp.	16 14 15	I.	Transit	Ingress 24 0 15
III.	Occult.	Reapp.	16 16 28	II.	Occult.	Reapp. 24 0 43
II.	Eclipse	Disapp. W.	16 18 12 34.6	I.	Shadow	Egress 24 1 36
I.	Shadow	Ingress	16 21 32	I.	Transit	Egress 24 2 27
II.	Occult.	Reapp.	16 22 0	I.	Eclipse	Disapp. 24 20 37 41.7
I.	Transit	Ingress	16 22 16	I.	Occult.	Reapp. 24 23 40
I.	Shadow	Egress	16 23 44	II.	Shadow	Ingress 25 15 8
I.	Transit	Egress	17 0 28	II.	Transit	Ingress W. 25 16 51
I.	Eclipse	Disapp.	17 18 43 58.5	II.	Shadow	Egress W. 25 17 30
I.	Occult.	Reapp.	17 21 40	I.	Shadow	Ingress W. 25 17 53
II.	Shadow	Ingress	18 12 32	I.	Transit	Ingress 25 18 45
II.	Transit	Ingress	18 14 4	II.	Transit	Egress 25 19 13
II.	Shadow	Egress	18 14 54	I.	Shadow	Egress 25 20 5
I.	Shadow	Ingress	18 16 0	I.	Transit	Egress 25 20 57
II.	Transit	Egress	18 16 26	I.	Eclipse	Disapp. 26 15 6 10.4
I.	Transit	Ingress	18 16 46	I.	Occult.	Reapp. 26 18 9
I.	Shadow	Egress W.	18 18 12	III.	Shadow	Ingress 27 5 7
I.	Transit	Egress	18 18 58	III.	Shadow	Egress 27 7 18
I.	Eclipse	Disapp.	19 13 12 28.2	III.	Transit	Ingress 27 8 43
I.	Occult.	Reapp.	19 16 10	II.	Eclipse	Disapp. 27 10 3 2.9
III.	Shadow	Ingress	20 1 10	III.	Transit	Egress 27 10 53
III.	Shadow	Egress	20 3 21	I.	Shadow	Ingress 27 12 21
III.	Transit	Ingress	20 4 22	I.	Transit	Ingress 27 13 14
III.	Transit	Egress	20 6 34	II.	Occult.	Reapp. 27 14 5
II.	Eclipse	Disapp.	20 7 29 25.6	I.	Shadow	Egress 27 14 33
I.	Shadow	Ingress	20 10 28	I.	Transit	Egress 27 15 26
I.	Transit	Ingress	20 11 15	I.	Eclipse	Disapp. 28 9 34 33.3
II.	Occult.	Reapp.	20 11 21	I.	Occult.	Reapp. 28 12 39
I.	Shadow	Egress	20 12 40	II.	Shadow	Ingress 29 4 26
I.	Transit	Egress	20 13 27	II.	Transit	Ingress 29 6 14
I.	Eclipse	Disapp.	21 7 40 51.9	II.	Shadow	Egress 29 6 47
I.	Occult.	Reapp.	21 10 40	I.	Shadow	Ingress 29 6 49
II.	Shadow	Ingress	22 1 50	I.	Transit	Ingress 29 7 44
II.	Transit	Ingress	22 3 27	II.	Transit	Egress 29 8 35
II.	Shadow	Egress	22 4 12	I.	Shadow	Egress 29 9 1
I.	Shadow	Ingress	22 4 56	I.	Transit	Egress 29 9 56
I.	Transit	Ingress	22 5 45	I.	Eclipse	Disapp. 30 4 3 1.2
II.	Transit	Egress	22 5 49	I.	Occult.	Reapp. 30 7 9
I.	Shadow	Egress	22 7 8	III.	Eclipse	Disapp. 30 19 18 56.0
I.	Transit	Egress	22 7 57	III.	Eclipse	Reapp. 30 21 13 48.8
I.	Eclipse	Disapp.	23 2 9 20.5	III.	Occult.	Disapp. 30 23 0
I.	Occult.	Reapp.	23 5 10	II.	Eclipse	Disapp. 30 23 19 49.1
III.	Eclipse	Disapp.	23 15 21 2.9	III.	Occult.	Reapp. 31 1 7
III.	Eclipse	Reapp.	23 17 16 15.9	I.	Shadow	Ingress 31 1 17

JUPITER'S SATELLITES, 1863. 461

WASHINGTON MEAN TIME.

DECEMBER.

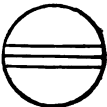
I. Transit	Ingress	^d 31	^h 2	^m 13	^s	I. Transit	Egress	^d 31	^h 4	^m 25	^s
II. Occult.	Reapp.	31	3	26		I. Eclipse	Disapp.	31	22	31	21.6
I. Shadow	Egress	31	3	29							

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.

d

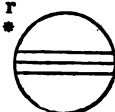
*



III.

d

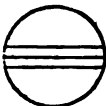
*



II.

d

*



IV. *Not Eclipsed.*

462 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE I.

Jan.	1	^h _m 10 53.5	March	18	^h _m 12 34.1	June	2	^h _m 13 23.8	Aug.	17	^h _m 15 53.1
	3	5 22.3		20	7 0.2		4	7 51.1		19	10 22.7
	4	23 51.1		22	1 26.2		6	2 18.4		21	4 52.5
	6	18 19.7		23	19 52.4		7	20 45.8		22	23 22.3
	8	12 48.3		25	14 18.3		9	15 13.2		24	17 52.1
	10	7 16.8		27	8 44.3		11	9 40.8		26	12 21.9
	12	1 45.5		29	3 10.3		13	4 8.4		28	6 51.8
	13	20 13.9		30	21 36.4		14	22 36.1		30	1 21.6
	15	14 42.3	April	1	16 2.3		16	17 3.9		31	19 51.4
	17	9 10.6		3	10 28.2		18	11 31.8	Sept.	2	14 21.3
	19	3 39.0		5	4 54.1		20	5 59.6		4	8 51.3
	20	22 7.1		6	23 20.1		22	0 27.4		6	3 21.2
	22	16 35.1		8	17 46.0		23	18 55.6		7	21 51.3
	24	11 3.2		10	12 11.9		25	13 23.7		9	16 21.3
	26	5 31.3		12	6 37.8		27	7 51.9		11	10 51.4
	27	23 59.1		14	1 3.7		29	2 20.1		13	5 21.3
	29	18 27.1		15	19 29.5		30	20 48.3		14	23 51.5
	31	12 54.8		17	13 55.5	July	2	15 16.6		16	18 21.6
Feb.	2	7 22.5		19	8 21.4		4	9 45.1		18	12 51.7
	4	1 50.1		21	2 47.5		6	4 13.6		20	7 21.9
	5	20 17.7		22	21 13.4		7	22 42.2		22	1 52.1
	7	14 45.2		24	15 39.4		9	17 10.8		23	20 22.3
	9	9 12.6		26	10 5.5		11	11 39.4		25	14 52.6
	11	3 40.0		28	4 31.7		13	6 8.2		27	9 22.8
	12	22 7.3		29	22 58.8		15	0 36.9		29	3 53.2
	14	16 34.5	May	1	17 23.9		16	19 5.8		30	22 23.4
	16	11 1.8		3	11 50.1		18	13 34.7	Dec.	1	22 3.5
	18	5 28.9		5	6 16.3		20	8 3.6		3	16 33.6
	19	23 55.9		7	0 42.6		22	2 32.6		5	11 3.7
	21	18 22.8		8	19 8.8		23	21 1.7		7	5 33.7
	23	12 49.8		10	13 35.1		25	15 30.7		9	0 3.8
	25	7 16.5		12	8 1.6		27	9 59.9		10	18 33.8
	27	1 43.3		14	2 28.2		29	4 29.0		12	13 3.8
	28	20 10.0		15	20 54.8		30	22 58.3		14	7 33.7
March	2	14 36.7		17	15 21.3	Aug.	1	17 27.6		16	2 3.6
	4	9 3.2		19	9 48.0		3	11 56.9		17	20 33.6
	6	3 29.7		21	4 14.8		5	6 26.3		19	15 3.5
	7	21 56.1		22	22 41.5		7	0 55.8		21	9 33.3
	9	16 22.6		24	17 8.3		8	19 25.2		23	4 3.1
	11	10 48.9		26	11 35.3		10	13 54.6		24	22 32.9
	13	5 15.3		28	6 2.3		12	8 24.2		26	17 2.7
	14	23 41.5		30	0 29.4		14	2 53.8		28	11 32.4
	16	18 8.0		31	18 56.5		15	21 23.4		30	6 2.1

SATELLITE II.

		^h _m			^h _m			^h _m			^h _m
Jan.	2	14 40.1	Jan.	27	11 39.0	Feb.	21	8 13.5	March	18	4 23.4
	6	3 59.0		31	0 53.8		24	21 22.4		21	17 31.6
	9	17 16.7	Feb.	3	14 8.5	28	10 35.2	25	6 40.1		
	13	6 34.1		7	3 22.5	March	3	23 45.9	28	19 47.6	
	16	19 51.2	10	16 34.9	7		12 55.9	April	1	8 55.7	
20	9 7.7	14	5 48.7	11	2 5.5	4	22 2.8				
23	22 23.4	17	19 2.3	14	15 14.4	8	11 10.7				

JUPITER'S SATELLITES, 1863. 463

WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE II.

April 12	^h 0 ^m 18.0	June 4	^h 5 ^m 43.8	July 27	^h 13 ^m 2.1	Sept. 15	^h 8 ^m 21.1
15	13 26.0	7	18 56.7	31	2 23.6	18	21 46.6
19	2 33.2	11	8 11.4	Aug. 3	15 44.6	22	11 10.5
22	15 41.3	14	21 25.4	7	5 6.5	26	0 35.1
26	4 49.2	18	10 41.3	10	18 28.0	29	13 48.4
29	17 57.7	21	23 56.5	14	7 50.7	Dec. 2	15 16.5
May 3	7 5.7	25	13 13.4	17	21 12.9	6	4 39.9
6	20 15.6	29	2 29.9	21	10 37.2	9	18 4.1
10	9 24.2	July 2	15 47.6	25	0 0.8	13	7 27.1
13	22 34.4	6	5 5.1	28	13 25.5	16	20 49.0
17	11 44.3	9	18 24.0	Sept. 1	2 45.6	20	10 11.6
21	0 55.6	13	7 52.3	4	16 9.5	23	23 34.0
24	14 6.4	16	21 12.2	8	5 32.9	27	12 56.0
28	3 18.8	20	10 21.5	11	18 57.1	31	2 17.8
31	16 30.5	23	23 42.1				

SATELLITE III.

Jan. 6	^h 18 ^m 43.6	March 26	^h 10 ^m 55.3	June 13	^h 0 ^m 22.1	Aug. 30	^h 21 ^m 0.4
13	22 44.3	April 2	14 10.6	20	4 7.0	Sept. 7	1 20.9
21	2 41.1	9	17 29.1	27	7 56.1	14	5 43.6
28	6 33.0	16	20 45.9	July 4	11 49.0	21	10 7.4
Feb. 4	10 20.8	24	0 3.0	11	15 46.3	28	14 32.5
11	14 3.7	May 1	3 21.8	18	19 47.5	Dec. 2	6 34.5
18	17 42.4	8	6 42.4	25	23 52.9	9	10 58.0
25	21 17.1	15	10 6.1	Aug. 2	4 1.1	16	15 20.9
March 5	0 47.3	22	13 33.4	9	8 12.3	23	19 42.6
12	4 13.5	29	17 5.3	16	12 26.0	31	0 2.3
19	7 35.9	June 5	20 41.7	23	16 41.9		

Factors by which x' and y' in the following Table must be multiplied to obtain the coördinates x and y for any time.

p = the inclination of the northern semi-minor axis of the apparent ellipse to the circle of declination; + East, — West.

x and y at the time of the visible phase of every fourth eclipse for the I^a, of every second eclipse for the II^a, and of every eclipse for the III^a and IV^a Satellites.

464 JUPITER'S SATELLITES, 1863.

SATELLITE I.

Date, 1863.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.		Date, 1863.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
	Factor for x' .	Factor for y' .	p .	z .	y .		Factor for x' .	Factor for y' .	p .	z .	y .
Jan. 1	0.920	-0.773	+22 49.2	-33	-5	June 6	1.075	-0.877	+24 2.1	+36	-5
8	0.948	0.801	22 40.3	34	5	13	1.054	0.849	24 2.9	37	5
15	0.968	0.830	22 33.0	35	5	20	1.032	0.823	24 2.5	37	5
22	0.989	0.859	22 27.1	36	5	27	1.011	0.798	24 0.8	37	5
29	1.010	0.888	22 23.0	36	6	July 4	0.991	0.775	23 57.9	37	5
Feb. 5	1.032	-0.917	+22 20.6	-36	-6	11	0.971	-0.755	+23 53.8	+36	-5
12	1.054	0.945	22 20.2	36	6	18	0.951	0.737	23 48.3	35	4
19	1.076	0.972	22 21.9	35	6	25	0.932	0.721	23 41.4	34	4
27	1.097	0.996	22 25.3	34	6	Aug. 1	0.915	0.706	23 33.3	33	4
March 6	1.116	1.017	22 30.5	33	6	8	0.899	0.693	23 24.1	32	4
13	1.133	-1.035	+22 37.1	-31	-7	15	0.884	-0.682	+23 13.5	+30	-4
20	1.147	1.047	22 45.2	29	7	22	0.870	0.674	23 1.5	29	4
27	1.158	1.054	22 54.0	27	7	30	0.858	0.668	22 48.0	27	4
April 3	1.165	1.056	23 3.2	24	7	Sept. 6	0.847	0.663	22 33.1	26	4
10	1.169	1.061	23 12.8	-20	7	13	0.838	0.659	22 16.8	24	4
17	1.169	-1.041	+23 22.3	+22	-7	20	0.830	-0.656	+21 59.1	+23	-4
24	1.165	1.026	23 31.2	26	7	27	0.824	0.655	21 40.0	+21	4
May 1	1.157	1.008	23 39.2	28	6	Dec. 1	0.826	0.707	17 51.0	-21	4
8	1.145	1.086	23 46.1	30	6	9	0.834	0.719	17 23.0	23	4
15	1.131	1.960	23 51.9	32	6	16	0.843	0.732	16 55.4	24	4
22	1.114	-1.933	+23 56.6	+34	-6	23	0.853	-0.746	+16 28.1	-26	-4
30	1.095	-1.905	+23 59.9	+35	-5	30	0.864	-0.761	+15 1.3	-27	-5

SATELLITE II.

Date,		AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.		Date,		AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
1863.		Factor for x' .	Factor for y' .	P .	z .	y .	1863.		Factor for x' .	Factor for y' .	P .	z .	y .
Jan.	2	0.932	-0.711	+23 13.8	-42	-8	June	7	1.070	-0.791	+24 28.6	+46	-9
	9	0.941	0.737	23 5.0	44	9		14	1.049	0.767	24 29.2	47	9
	16	0.971	0.764	22 57.7	45	9		21	1.028	0.745	24 28.4	17 48	9
	23	0.992	0.792	22 51.9	46	10		29	1.006	0.724	24 26.3	17 48	9
	31	1.014	0.819	22 47.9	46	10		July	6	0.985	0.705	24 22.9	17 47	8
		1.037	-0.846	+22 45.8	-45	-10	13		0.965	-0.688	+24 18.3	17 46	-8
		1.059	0.872	22 45.7	44	10	20		0.946	0.674	24 12.3	17 45	8
		1.081	0.897	22 47.6	43	11	27		0.927	0.662	24 5.0	43	8
		1.101	0.918	22 51.4	41	11	Aug.		3	0.910	0.651	23 56.4	41	8
		1.120	0.936	22 56.9	39	11		10	0.894	0.642	23 46.4	39	7
	1.136	-0.950	+23 4.0	-36	-11	17		0.880	-0.634	+23 34.9	+37	-7	
	1.150	0.960	23 12.3	32	12	25		0.867	0.628	23 22.1	35	7	
		0.965	23 21.5	28	12	Sept.		1	0.856	0.624	23 7.8	33	7
		0.964	23 31.2	23	12		8	0.845	0.622	22 52.0	31	7	
		0.958	23 40.9	18 18	12		15	0.836	0.621	22 34.8	28	7	
	7	+23 50.3	+23	-12	22		0.828	-0.621	+22 16.2	+26	-7		
	2	23 59.0	27	11	29		0.822	0.622	21 56.1	+23	7		
	3	24 6.9	32	11	Dec.	2	0.827	0.686	18 5.1	-23	8		
	1	24 13.7	36	11		9	0.834	0.699	17 36.4	26	8		
	1	24 19.4	39	10		16	0.843	0.713	17 7.9	28	9		
		+24 23.8	+42	-10		23	0.854	-0.729	+16 39.6	-31	-9		
		+24 26.8	+44	-10		31	0.866	-0.747	+16 11.4	-33	-9		

JUPITER'S SATELLITES, 1863. 465

SATELLITE III.

Date, 1863.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.			
	Factor for x' .	Factor for y' .	p .	Disappearance.		Reappearance.	
				x .	y .	x .	y .
Jan. 6	0.943	-0.706	+22° 49.9	-58 ^h	-12 ^m	-35 ^s	-12 ^s
13	0.963	0.738	22 41.5	60	12	36	12
21	0.984	0.769	22 35.0	61	13	36	13
28	1.006	0.799	22 30.4	61	13	36	13
Feb. 4	1.028	0.826	22 27.7	61	14	36	14
11	1.051	-0.852	+22 27.1	-60	-14	-34	-14
18	1.073	0.878	22 28.4	58	15	32	15
25	1.094	0.899	22 31.5	55	15	28	15
March 5	1.113	0.918	22 36.2	51	15	24	15
12	1.130	0.935	22 42.5	45	15	-18	-15
19	1.145	-0.947	+22 50.3	-39	-16	..	..
26	1.157	0.954	22 59.0	32	16	..	..
April 2	1.165	0.955	23 8.3	24	16	..	..
9	1.169	0.950	23 17.9	-16	-16	..	..
16	1.169	0.941	23 27.1	..	..	+19	-16
24	1.165	-0.927	+23 35.8	..	..	+27	-16
May 1	1.157	0.909	23 43.8	..	..	34	15
8	1.145	0.887	23 50.8	..	..	41	15
15	1.131	0.863	23 56.6	+20	-14	47	14
22	1.114	0.837	24 1.3	26	14	52	14
29	1.095	-0.810	+24 4.7	+31	-14	+56	-14
June 5	1.075	0.784	24 6.8	34	13	58	13
13	1.054	0.759	24 7.7	37	13	60	13
20	1.033	0.735	24 7.5	39	12	61	12
27	1.012	0.713	24 5.9	40	12	62	12
July 4	0.991	-0.692	+24 2.9	+40	-12	+61	-12
11	0.970	0.673	23 58.7	40	11	60	11
18	0.951	0.656	23 53.3	39	11	59	11
25	0.932	0.641	23 46.6	38	11	57	11
Aug. 2	0.914	0.628	23 38.7	36	11	54	11
9	0.898	-0.618	+23 29.3	+33	-10	+51	-10
16	0.883	0.610	23 18.6	30	10	48	10
23	0.870	0.603	23 6.4	27	10	45	10
30	0.858	0.597	22 52.9	25	10	42	10
Sept. 7	0.847	0.593	22 37.9	22	10	38	10
14	0.837	-0.591	+22 21.4	+18	-10	+34	-10
21	0.829	0.590	22 3.5	..	..	30	10
28	0.823	0.590	21 44.1	..	..	+26	10
Dec. 2	0.826	0.649	17 59.9	-26	11	..	..
9	0.834	0.661	17 31.7	30	11	..	..
16	0.843	-0.674	+17 3.9	-34	-11	-17	-11
23	0.854	0.689	16 36.6	38	12	21	12
31	0.866	-0.705	+16 9.6	-41	-12	-25	-12

466 JUPITER'S SATELLITES, 1863.

SATELLITE IV.

Date, 1863.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.			
	Factor for x' .	Factor for y' .	p .	Disappearance.		Reappearance.	
				z .	y .	z .	y .

SATELLITE I.

COORDINATES IN THE MEAN APPARENT ELLIPSE, DESCRIBED BY THE SATELLITE, AND FOR THE MEAN DISTANCE OF JUPITER FROM THE SUN, FOR THE TIME (t) AFTER GEOCENTRIC SUPERIOR CONJUNCTION.

t	x'	y'	t	x'	y'	t	x'	y'
d h m			d h m			d h m		
0 0 0	+ 0.0	+ 6.6	0 5 20	+ 77.5	+ 4.7	0 10 40	+109.1	— 0.1
0 0 20	5.4	6.6	0 5 40	81.2	4.4	0 11 0	109.0	0.4
0 0 40	10.8	6.6	0 6 0	84.7	4.2	0 11 20	108.6	0.7
0 1 0	16.1	6.6	0 6 20	88.0	3.9	0 11 40	107.9	1.0
0 1 20	21.4	6.5	0 6 40	91.1	3.7	0 12 0	106.9	1.3
0 1 40	+ 26.6	+ 6.4	0 7 0	+ 94.0	+ 3.4	0 12 20	+105.7	— 1.7
0 2 0	31.8	6.3	0 7 20	96.6	3.1	0 12 40	104.2	2.0
0 2 20	36.9	6.2	0 7 40	99.0	2.8	0 13 0	102.5	2.3
0 2 40	42.0	6.1	0 8 0	101.1	2.5	0 13 20	100.5	2.6
0 3 0	46.9	6.0	0 8 20	103.0	2.2	0 13 40	98.3	2.9
0 3 20	+ 51.7	+ 5.8	0 8 40	+104.7	+ 1.9	0 14 0	+ 95.8	— 3.2
0 3 40	56.4	5.7	0 9 0	106.1	1.6	0 14 20	93.1	3.5
0 4 0	60.9	5.5	0 9 20	107.3	1.3	0 14 40	90.2	3.7
0 4 20	65.3	5.3	0 9 40	108.1	0.9	0 15 0	87.1	4.0
0 4 40	69.5	5.1	0 10 0	108.7	0.6	0 15 20	83.7	4.3
0 5 0	+ 73.6	+ 4.9	0 10 20	+109.1	+ 0.3	0 15 40	+ 80.1	— 4.5

JUPITER'S SATELLITES, 1863. 467

COÖRDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE I.

<i>t</i>	<i>x'</i>	<i>y</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	<i>u</i>	<i>u</i>	d. h. m.	<i>u</i>	<i>u</i>	d. h. m.	<i>u</i>	<i>u</i>
0 16 0	+ 76.4	- 4.7	1 1 40	- 66.6	- 5.2	1 11 0	- 97.6	+ 3.0
0 16 20	72.5	5.0	1 2 0	70.8	5.0	1 11 20	95.1	3.3
0 16 40	68.4	5.2	1 2 20	74.8	4.8	1 11 40	92.3	3.5
0 17 0	64.1	5.4	1 2 40	78.6	4.6	1 12 0	89.3	3.8
0 17 20	59.6	5.5	1 3 0	82.2	4.4	1 12 20	86.1	4.1
0 17 40	+ 55.0	- 5.7	1 3 20	- 85.6	- 4.1	1 12 40	- 82.7	+ 4.3
0 18 0	50.3	5.9	1 3 40	88.9	3.8	1 13 0	79.1	4.6
0 18 20	45.5	6.0	1 4 0	91.9	3.6	1 13 20	75.3	4.8
0 18 40	40.5	6.1	1 4 20	94.7	3.3	1 13 40	71.3	5.0
0 19 0	35.3	6.3	1 4 40	97.3	3.0	1 14 0	67.1	5.2
0 19 20	+ 30.4	- 6.4	1 5 0	- 99.6	- 2.7	1 14 20	- 62.8	+ 5.4
0 19 40	25.2	6.4	1 5 20	101.7	2.4	1 14 40	58.3	5.6
0 20 0	19.9	6.5	1 5 40	103.5	2.1	1 15 0	53.7	5.8
0 20 20	14.6	6.6	1 6 0	105.1	1.8	1 15 20	49.0	5.9
0 20 40	9.2	6.6	1 6 20	106.4	1.5	1 15 40	44.1	6.1
0 21 0	+ 3.8	- 6.6	1 6 40	- 107.5	- 1.2	1 16 0	- 39.1	+ 6.2
0 21 20	- 1.5	6.6	1 7 0	108.2	0.8	1 16 20	34.0	6.3
0 21 40	6.9	6.6	1 7 20	108.8	0.5	1 16 40	28.9	6.4
0 22 0	12.3	6.6	1 7 40	109.1	- 0.2	1 17 0	23.7	6.5
0 22 20	17.6	6.5	1 8 0	109.1	+ 0.1	1 17 20	18.4	6.5
0 22 40	- 22.9	- 6.5	1 8 20	- 108.9	+ 0.5	1 17 40	- 13.0	+ 6.6
0 23 0	28.1	6.4	1 8 40	108.4	0.8	1 18 0	7.7	6.6
0 23 20	33.3	6.3	1 9 0	107.6	1.1	1 18 20	- 2.3	6.6
0 23 40	38.4	6.2	1 9 20	106.6	1.4	1 18 40	+ 3.1	6.6
1 0 0	43.4	6.1	1 9 40	105.3	1.8	1 19 0	8.5	6.6
1 0 20	- 48.3	- 5.9	1 10 0	- 103.8	+ 2.1	1 19 20	+ 13.8	+ 6.6
1 0 40	53.1	5.8	1 10 20	102.0	2.4	1 19 40	19.1	6.5
1 1 0	57.7	5.6	1 10 40	- 99.9	+ 2.7	1 20 0	+ 24.4	+ 6.5
1 1 20	- 62.2	- 5.4						

SATELLITE II.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	<i>u</i>	<i>u</i>	d. h. m.	<i>u</i>	<i>u</i>	d. h. m.	<i>u</i>	<i>u</i>
0 0 0	+ 0.0	+ 12.2	0 10 40	+ 122.9	+ 8.6	0 21 20	+ 173.8	- 0.0
0 0 40	8.5	12.2	0 11 20	128.8	8.2	0 22 0	173.6	0.6
0 1 20	17.0	12.1	0 12 0	134.4	7.7	0 22 40	172.9	1.2
0 2 0	25.5	12.1	0 12 40	139.6	7.3	0 23 20	171.8	1.8
0 2 40	33.9	12.0	0 13 20	144.5	6.8	1 0 0	170.4	2.4
0 3 20	+ 42.2	+ 11.8	0 14 0	+ 149.0	+ 6.3	1 0 40	+ 168.5	- 3.0
0 4 0	50.5	11.7	0 14 40	153.2	5.7	1 1 20	166.2	3.5
0 4 40	58.6	11.5	0 15 20	157.0	5.2	1 2 0	163.5	4.1
0 5 20	66.5	11.3	0 16 0	160.5	4.7	1 2 40	160.4	4.7
0 6 0	74.3	11.0	0 16 40	163.6	4.1	1 3 20	157.0	5.2
0 6 40	+ 81.9	+ 10.8	0 17 20	+ 166.3	+ 3.5	1 4 0	+ 153.2	- 5.8
0 7 20	89.4	10.5	0 18 0	168.6	3.0	1 4 40	149.0	6.3
0 8 0	96.6	10.1	0 18 40	170.5	2.4	1 5 20	144.4	6.8
0 8 40	103.6	9.8	0 19 20	171.9	1.8	1 6 0	139.5	7.3
0 9 20	110.3	9.4	0 20 0	172.9	1.2	1 6 40	134.2	7.7
0 10 0	+ 116.7	+ 9.0	0 20 40	+ 173.6	+ 0.6	1 7 20	+ 128.6	- 8.2

468 JUPITER'S SATELLITES, 1863.

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE II.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	"	"	d. h. m.	"	"	d. h. m.	"	"
1 8 0	+122.7	- 8.6	2 3 20	-103.7	- 9.8	2 22 0	-156.9	+ 5.2
1 8 40	116.5	9.0	2 4 0	110.4	9.4	2 22 40	153.0	5.8
1 9 20	110.1	9.4	2 4 40	116.8	9.0	2 23 20	148.8	6.3
1 10 0	103.4	9.8	2 5 20	123.0	8.6	3 0 0	144.2	6.8
1 10 40	96.4	10.1	2 6 0	128.9	8.2	3 0 40	139.3	7.3
1 11 20	+ 89.2	-10.5	2 6 40	-134.5	- 7.7	3 1 20	-134.1	+ 7.8
1 12 0	81.7	10.8	2 7 20	139.7	7.2	3 2 0	128.5	8.2
1 12 40	74.1	11.0	2 8 0	144.6	6.7	3 2 40	122.6	8.6
1 13 20	66.3	11.3	2 8 40	149.1	6.2	3 3 20	116.4	9.0
1 14 0	58.3	11.5	2 9 20	153.3	5.7	3 4 0	109.9	9.4
1 14 40	+ 50.2	-11.7	2 10 0	-157.1	- 5.2	3 4 40	-103.1	+ 9.8
1 15 20	42.0	11.8	2 10 40	160.6	4.6	3 5 20	96.1	10.1
1 16 0	33.7	12.0	2 11 20	163.7	4.1	3 6 0	88.9	10.5
1 16 40	25.3	12.1	2 12 0	166.4	3.5	3 6 40	81.5	10.8
1 17 20	16.8	12.1	2 12 40	168.6	2.9	3 7 20	73.9	11.0
1 18 0	+ 8.3	-12.2	2 13 20	-170.4	- 2.3	3 8 0	- 66.1	+11.3
1 18 40	- 0.2	12.2	2 14 0	171.9	1.8	3 8 40	58.1	11.5
1 19 20	8.8	12.2	2 14 40	173.0	1.2	3 9 20	50.0	11.7
1 20 0	17.3	12.1	2 15 20	173.6	- 0.6	3 10 0	41.8	11.8
1 20 40	25.7	12.1	2 16 0	173.8	+ 0.0	3 10 40	33.5	12.0
1 21 20	- 34.1	-12.0	2 16 40	-173.6	+ 0.6	3 11 20	- 25.1	+12.1
1 22 0	42.4	11.8	2 17 20	172.9	1.2	3 12 0	16.6	12.1
1 22 40	50.6	11.7	2 18 0	171.8	1.8	3 12 40	- 8.1	12.2
1 23 20	58.7	11.5	2 18 40	170.3	2.4	3 13 20	+ 0.4	12.2
2 0 0	66.7	11.3	2 19 20	168.4	3.0	3 14 0	9.0	12.3
2 0 40	- 74.5	-11.0	2 20 0	-166.2	+ 3.5	3 14 40	+ 17.5	+12.1
2 1 20	82.1	10.7	2 20 40	163.5	4.1	3 15 20	26.0	12.1
2 2 0	89.5	10.4	2 21 20	-160.4	+ 4.7	3 16 0	+ 34.4	+12.0
2 2 40	- 96.7	-10.1						

SATELLITE III.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	"	"	d. h. m.	"	"	d. h. m.	"	"
0 0 0	+ 0.0	+17.4	0 21 20	+194.7	+12.4	1 18 40	+277.2	+ 0.2
0 1 20	13.5	17.4	0 22 40	204.1	11.8	1 20 0	277.0	- 0.6
0 2 40	26.9	17.3	1 0 0	213.0	11.1	1 21 20	276.2	1.5
0 4 0	40.3	17.2	1 1 20	221.4	10.5	1 22 40	274.7	2.3
0 5 20	53.6	17.1	1 2 40	229.3	9.8	2 0 0	272.6	3.2
0 6 40	+ 66.8	+16.9	1 4 0	+236.6	+ 9.1	2 1 20	+269.8	- 4.0
0 8 0	79.8	16.7	1 5 20	243.3	8.3	2 2 40	266.4	4.8
0 9 20	92.7	16.4	1 6 40	249.5	7.6	2 4 0	262.3	5.6
0 10 40	105.3	16.1	1 8 0	255.1	6.8	2 5 20	257.6	6.4
0 12 0	117.6	15.8	1 9 20	260.0	6.0	2 6 40	252.3	7.2
0 13 20	+129.7	+15.4	1 10 40	+264.3	+ 5.2	2 8 0	+246.4	- 8.0
0 14 40	141.5	15.0	1 12 0	268.0	4.4	2 9 20	240.0	8.7
0 16 0	153.0	14.5	1 13 20	271.1	3.6	2 10 40	233.0	9.4
0 17 20	164.1	14.0	1 14 40	273.6	2.7	2 12 0	225.4	10.1
0 18 40	174.7	13.5	1 16 0	275.5	1.9	2 13 20	217.3	10.8
0 20 0	+184.9	+13.0	1 17 20	+276.7	+ 1.1	2 14 40	+208.6	-11.5

JUPITER'S SATELLITES, 1863. 469

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE III.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	"	"	d. h. m.	"	"	d. h. m.	"	"
2 16 0	+199.5	-12.1	4 6 40	-158.4	-14.3	5 20 0	-255.1	+ 6.8
2 17 20	189.9	12.7	4 8 0	169.3	13.8	5 21 20	249.5	7.6
2 18 40	179.9	13.3	4 9 20	179.8	13.3	5 22 40	243.3	8.3
2 20 0	169.4	13.8	4 10 40	189.9	12.7	6 0 0	236.6	9.1
2 21 20	158.5	14.3	4 12 0	199.5	12.1	6 1 20	229.3	9.8
2 22 40	+147.2	-14.8	4 13 20	-208.6	-11.5	6 2 40	-221.4	+10.5
3 0 0	135.6	15.2	4 14 40	217.3	10.8	6 4 0	213.0	11.1
3 1 20	123.7	15.6	4 16 0	225.5	10.1	6 5 20	204.1	11.8
3 2 40	111.5	16.0	4 17 20	233.1	9.4	6 6 40	194.7	12.4
3 4 0	99.0	16.3	4 18 40	240.1	8.7	6 8 0	184.9	13.0
3 5 20	+ 86.3	-16.6	4 20 0	-246.5	- 8.0	6 9 20	-174.7	+13.5
3 6 40	73.3	16.8	4 21 20	252.3	7.2	6 10 40	164.1	14.0
3 8 0	60.2	17.0	4 22 40	257.6	6.4	6 12 0	153.0	14.5
3 9 20	47.0	17.2	5 0 0	262.3	5.6	6 13 20	141.5	15.0
3 10 40	33.6	17.3	5 1 20	266.4	4.8	6 14 40	129.7	15.4
3 12 0	+ 20.2	-17.4	5 2 40	-269.8	- 4.0	6 16 0	-117.6	+15.8
3 13 20	+ 6.7	17.4	5 4 0	272.6	3.2	6 17 20	105.2	16.1
3 14 40	- 6.8	17.4	5 5 20	274.7	2.3	6 18 40	92.6	16.4
3 16 0	20.3	17.4	5 6 40	276.2	1.5	6 20 0	79.8	16.7
3 17 20	33.7	17.3	5 8 0	277.0	- 0.6	6 21 20	66.8	16.9
3 18 40	- 47.1	-17.2	5 9 20	-277.2	+ 0.2	6 22 40	- 53.6	+17.1
3 20 0	60.3	17.0	5 10 40	276.7	1.1	7 0 0	40.3	17.2
3 21 20	73.4	16.8	5 12 0	275.5	1.9	7 1 20	26.9	17.3
3 22 40	86.3	16.6	5 13 20	273.7	2.7	7 2 40	- 13.4	17.4
4 0 0	99.0	16.3	5 14 40	271.2	3.6	7 4 0	+ 0.1	17.4
4 1 20	-111.5	-16.0	5 16 0	-268.1	+ 4.4	7 5 20	+ 13.6	+17.4
4 2 40	123.7	15.6	5 17 20	264.4	5.2	7 6 40	27.0	17.3
4 4 0	135.7	15.2	5 18 40	-260.1	+ 6.0	7 8 0	+ 40.4	+17.2
4 5 20	-147.3	-14.8						

SATELLITE IV.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h.	"	"	d. h.	"	"	d. h.	"	"
0 0	+ 0.0	+34.8	2 0	+332.3	+25.5	4 0	+486.2	+ 2.5
0 3	22.8	34.8	2 3	348.6	24.3	4 3	487.3	+ 0.8
0 6	45.6	34.7	2 6	364.1	23.1	4 6	487.3	- 0.8
0 9	68.3	34.5	2 9	378.9	21.9	4 9	486.3	2.4
0 12	90.9	34.2	2 12	392.9	20.6	4 12	484.2	4.1
0 15	+113.2	+33.9	2 15	+406.0	+19.3	4 15	+480.9	- 5.7
0 18	135.3	33.5	2 18	418.2	17.9	4 18	476.6	7.3
0 21	157.1	33.0	2 21	429.5	16.5	4 21	471.3	8.9
1 0	178.5	32.4	3 0	439.8	15.0	5 0	465.0	10.4
1 3	199.6	31.8	3 3	449.1	13.5	5 3	457.7	19.7
1 6	+220.3	+31.1	3 6	+457.5	+12.0	5 6	+449.3	-13.5
1 9	240.4	30.3	3 9	464.9	10.5	5 9	439.9	15.0
1 12	260.0	29.5	3 12	471.3	8.9	5 12	429.6	16.4
1 15	279.0	28.6	3 15	476.6	7.3	5 15	418.4	17.9
1 18	297.4	27.6	3 18	480.8	5.7	5 18	406.2	19.3
1 21	+315.2	+26.6	3 21	+484.0	+ 4.1	5 21	+393.1	-20.6

460 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME.

DECEMBER.

			d	h	m	s				d	h	m	s
I.	Eclipse	Disapp.	16	0	15	29.8	III.	Occult.	Disapp. W.	23	18	38	
I.	Occult.	Reapp.	16	3	10		II.	Eclipse	Disapp.	23	20	46	16.4
III.	Eclipse	Disapp.	16	11	22	30.8	III.	Occult.	Reapp.	23	20	49	
III.	Eclipse	Reapp.	16	13	18	5.2	I.	Shadow	Ingress	23	23	24	
III.	Occult.	Disapp.	16	14	15		I.	Transit	Ingress	24	0	15	
III.	Occult.	Reapp.	16	16	28		II.	Occult.	Reapp.	24	0	43	
II.	Eclipse	Disapp. W.	16	18	12	34.6	I.	Shadow	Egress	24	1	36	
I.	Shadow	Ingress	16	21	32		I.	Transit	Egress	24	2	27	
II.	Occult.	Reapp.	16	22	0		I.	Eclipse	Disapp.	24	20	37	41.7
I.	Transit	Ingress	16	22	16		I.	Occult.	Reapp.	24	23	40	
I.	Shadow	Egress	16	23	44		II.	Shadow	Ingress	25	15	8	
I.	Transit	Egress	17	0	28		II.	Transit	Ingress W.	25	16	51	
I.	Eclipse	Disapp.	17	18	43	58.5	II.	Shadow	Egress W.	25	17	30	
I.	Occult.	Reapp.	17	21	40		I.	Shadow	Ingress W.	25	17	53	
II.	Shadow	Ingress	18	12	32		I.	Transit	Ingress	25	18	45	
II.	Transit	Ingress	18	14	4		II.	Transit	Egress	25	19	13	
II.	Shadow	Egress	18	14	54		I.	Shadow	Egress	25	20	5	
I.	Shadow	Ingress	18	16	0		I.	Transit	Egress	25	20	57	
II.	Transit	Egress	18	16	26		I.	Eclipse	Disapp.	26	15	6	10.4
I.	Transit	Ingress	18	16	46		I.	Occult.	Reapp.	26	18	9	
I.	Shadow	Egress W.	18	18	12		III.	Shadow	Ingress	27	5	7	
I.	Transit	Egress	18	18	58		III.	Shadow	Egress	27	7	18	
I.	Eclipse	Disapp.	19	13	12	28.2	III.	Transit	Ingress	27	8	43	
I.	Occult.	Reapp.	19	16	10		II.	Eclipse	Disapp.	27	10	3	2.9
III.	Shadow	Ingress	20	1	10		III.	Transit	Egress	27	10	53	
III.	Shadow	Egress	20	3	21		I.	Shadow	Ingress	27	12	21	
III.	Transit	Ingress	20	4	22		I.	Transit	Ingress	27	13	14	
III.	Transit	Egress	20	6	34		II.	Occult.	Reapp.	27	14	5	
II.	Eclipse	Disapp.	20	7	29	25.6	I.	Shadow	Egress	27	14	33	
I.	Shadow	Ingress	20	10	28		I.	Transit	Egress	27	15	26	
I.	Transit	Ingress	20	11	15		I.	Eclipse	Disapp.	28	9	34	33.3
II.	Occult.	Reapp.	20	11	21		I.	Occult.	Reapp.	28	12	39	
I.	Shadow	Egress	20	12	40		II.	Shadow	Ingress	29	4	26	
I.	Transit	Egress	20	13	27		II.	Transit	Ingress	29	6	14	
I.	Eclipse	Disapp.	21	7	40	51.9	II.	Shadow	Egress	29	6	47	
I.	Occult.	Reapp.	21	10	40		I.	Shadow	Ingress	29	6	49	
II.	Shadow	Ingress	22	1	50		I.	Transit	Ingress	29	7	44	
II.	Transit	Ingress	22	3	27		II.	Transit	Egress	29	8	35	
II.	Shadow	Egress	22	4	12		I.	Shadow	Egress	29	9	1	
I.	Shadow	Ingress	22	4	56		I.	Transit	Egress	29	9	56	
I.	Transit	Ingress	22	5	45		I.	Eclipse	Disapp.	30	4	3	1.2
II.	Transit	Egress	22	5	49		I.	Occult.	Reapp.	30	7	9	
I.	Shadow	Egress	22	7	8		III.	Eclipse	Disapp.	30	19	18	56.0
I.	Transit	Egress	22	7	57		III.	Eclipse	Reapp.	30	21	13	48.8
I.	Eclipse	Disapp.	23	2	9	20.5	III.	Occult.	Disapp.	30	23	0	
I.	Occult.	Reapp.	23	5	10		II.	Eclipse	Disapp.	30	23	19	49.1
III.	Eclipse	Disapp.	23	15	21	2.9	III.	Occult.	Reapp.	31	1	7	
III.	Eclipse	Reapp.	23	17	16	15.9	I.	Shadow	Ingress	31	1	17	

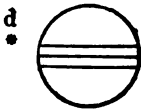
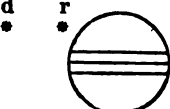
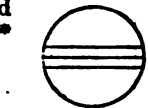
JUPITER'S SATELLITES, 1863. 461

WASHINGTON MEAN TIME.

DECEMBER.

I. Transit	Ingress	^d 31 ^h 2 ^m 13 ^s	I. Transit	Egress	^d 31 ^h 4 ^m 25 ^s
II. Occult.	Reapp.	31 3 26	I. Eclipse	Disapp.	31 22 31 21.6
I. Shadow	Egress	31 3 29			

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 	III. 
II. 	IV. <i>Not Eclipsed.</i>

462 JUPITER'S SATELLITES, 1863.

WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE I.

		h	m			h	m			h	m			h	m
Jan.	1	10	53.5	March	18	12	34.1	June	2	13	23.8	Aug.	17	15	53.1
	3	5	22.3		20	7	0.2		4	7	51.1		19	10	22.7
	4	23	51.1		22	1	26.2		6	2	18.4		21	4	52.5
	6	18	19.7		23	19	52.4		7	20	45.8		22	23	22.3
	8	12	48.3		25	14	18.3		9	15	13.2		24	17	52.1
	10	7	16.8		27	8	44.3		11	9	40.8		26	12	21.9
	12	1	45.5		29	3	10.3		13	4	8.4		28	6	51.8
	13	20	13.9		30	21	36.4		14	22	36.1		30	1	21.6
	15	14	42.3	April	1	16	2.3		16	17	3.9	Sept.	31	19	51.4
	17	9	10.6		3	10	28.2		18	11	31.8		2	14	21.3
	19	3	39.0		5	4	54.1		20	5	59.6		4	8	51.3
	20	22	7.1		6	23	20.1		22	0	27.4		6	3	21.2
	22	16	35.1		8	17	46.0		23	18	55.6		7	21	51.3
	24	11	3.2		10	12	11.9		25	13	23.7		9	16	21.3
	26	5	31.3		12	6	37.8		27	7	51.9		11	10	51.4
	27	23	59.1		14	1	3.7		29	2	20.1		13	5	21.3
	29	18	27.1		15	19	29.5		30	20	48.3		14	23	51.5
	31	12	54.8		17	13	55.5	July	2	15	16.6		16	18	21.6
Feb.	2	7	22.5		19	8	21.4		4	9	45.1		18	12	51.7
	4	1	50.1		21	2	47.5		6	4	13.6		20	7	21.9
	5	20	17.7		22	21	13.4		7	22	42.2		22	1	52.1
	7	14	45.2		24	15	39.4		9	17	10.8		23	20	22.3
	9	9	12.6		26	10	5.5		11	11	39.4		25	14	52.6
	11	3	40.0		28	4	31.7		13	6	8.2		27	9	22.8
	12	22	7.3		29	22	58.8		15	0	36.9		29	3	53.2
	14	16	34.5	May	1	17	23.9		16	19	5.8	Dec.	30	22	23.4
	16	11	1.8		3	11	50.1		18	13	34.7		1	22	3.5
	18	5	28.9		5	6	16.3		20	8	3.6		3	16	33.6
	19	23	55.9		7	0	42.6		22	2	32.6		5	11	3.7
	21	18	22.8		8	19	8.8		23	21	1.7		7	5	33.7
	23	12	49.8		10	13	35.1		25	15	30.7		9	0	3.8
	25	7	16.5		12	8	1.6		27	9	59.9		10	18	33.8
	27	1	43.3		14	2	28.2		29	4	29.0		12	13	3.8
	28	20	10.0		15	20	54.8		30	22	58.3		14	7	33.7
	March 2	14	36.7		17	15	21.3	Aug.	1	17	27.6		16	2	3.6
	4	9	3.2		19	9	48.0		3	11	56.9		17	20	33.6
	6	3	20.7		21	4	14.8		5	6	26.3		19	15	3.5
	7	21	56.1		22	22	41.5		7	0	55.8		21	9	33.3
	9	16	22.6		24	17	8.3		8	19	25.2		23	4	3.1
	11	10	48.9		26	11	35.3		10	13	54.6		24	22	32.9
	13	5	15.3		28	6	2.3		12	8	24.2		26	17	2.7
	14	23	41.5		30	0	29.4		14	2	53.8		28	11	32.4
	16	18	8.0		31	18	56.5		15	21	23.4		30	6	2.1

SATELLITE II.

		h	m			h	m			h	m			h	m
Jan.	2	14	40.1	Jan.	27	11	39.0	Feb.	21	8	13.5	March	18	4	23.4
	6	3	59.0		31	0	53.8		24	21	22.4		21	17	31.6
	9	17	16.7		3	14	8.5		28	10	35.2		25	6	40.1
	13	6	34.1	Feb.	7	3	22.5		March 3	23	45.9		28	19	47.6
	16	19	51.2		10	16	34.9		7	12	55.9	April	1	8	55.7
	20	0	-		14	5	48.7		11	2	5.5		4	22	2.8
	22				17	19	2.3		14	15	14.4		8	11	10.7

JUPITER'S SATELLITES, 1863. 463

WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE II.

April 12	^h 0 ^m 18.0	June 4	^h 5 ^m 43.8	July 27	^h 13 ^m 2.1	Sept. 15	^h 8 ^m 21.1
15	13 26.0	7	18 56.7	31	2 23.6	18	21 46.6
19	2 33.2	11	8 11.4	Aug. 3	15 44.6	22	11 10.5
22	15 41.3	14	21 25.4	7	5 6.5	26	0 35.1
26	4 49.2	18	10 41.3	10	18 28.0	29	13 48.4
29	17 57.7	21	23 56.5	14	7 50.7	Dec. 2	15 16.5
May 3	7 5.7	25	13 13.4	17	21 12.9	6	4 39.9
6	20 15.6	29	2 29.9	21	10 37.2	9	18 4.1
10	9 24.2	July 2	15 47.6	25	0 0.8	13	7 27.1
13	22 34.4	6	5 5.1	28	13 25.5	16	20 49.0
17	11 44.3	9	18 24.0	Sept. 1	2 45.6	20	10 11.6
21	0 55.6	13	7 52.3	4	16 9.5	23	23 34.0
24	14 6.4	16	21 12.2	8	5 32.9	27	12 56.0
28	3 18.8	20	10 21.5	11	18 57.1	31	2 17.8
31	16 30.5	23	23 42.1				

SATELLITE III.

Jan. 6	^h 18 ^m 43.6	March 26	^h 10 ^m 55.3	June 13	^h 0 ^m 22.1	Aug. 30	^h 21 ^m 0.4
13	22 44.3	April 2	14 10.6	20	4 7.0	Sept. 7	1 20.9
21	2 41.1	9	17 29.1	27	7 56.1	14	5 43.6
28	6 33.0	16	20 45.9	July 4	11 49.0	21	10 7.4
Feb. 4	10 20.8	24	0 3.0	11	15 46.3	28	14 32.5
11	14 3.7	May 1	3 21.8	18	19 47.5	Dec. 2	6 34.5
18	17 42.4	8	6 42.4	25	23 52.9	9	10 58.0
25	21 17.1	15	10 6.1	Aug. 2	4 1.1	16	15 20.9
March 5	0 47.3	22	13 33.4	9	8 12.3	23	19 42.6
12	4 13.5	29	17 5.3	16	12 26.0	31	0 2.3
19	7 35.9	June 5	20 41.7	23	16 41.9		

Factors by which x' and y' in the following Table must be multiplied to obtain the coördinates x and y for any time.

p = the inclination of the northern semi-minor axis of the apparent ellipse to the circle of declination; + East, — West.

x and y at the time of the visible phase of every fourth eclipse for the I^a, of every second eclipse for the II^a, and of every eclipse for the III^a and IV^a Satellites.

464 JUPITER'S SATELLITES, 1863.

SATELLITE I.

Date, 1863.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.		Date, 1863.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
	Factor for x' .	Factor for y' .	P .	z .	y .		Factor for x' .	Factor for y' .	P .	z .	y .
Jan. 1	0.929	-0.773	+22 49.2	-33	-5	June 6	1.075	-0.877	+24 2.1	+36	-5
8	0.948	0.801	22 40.3	34	5	13	1.054	0.849	24 2.9	37	5
15	0.968	0.830	22 33.0	35	5	20	1.032	0.823	24 2.5	37	5
22	0.989	0.859	22 27.1	36	5	27	1.011	0.798	24 0.8	37	5
29	1.010	0.888	22 23.0	36	6	July 4	0.991	0.775	23 57.9	37	5
Feb. 5	1.032	-0.917	+22 20.6	-36	-6	11	0.971	-0.755	+23 53.8	+36	-5
12	1.054	0.945	22 20.2	36	6	18	0.951	0.737	23 48.3	35	4
19	1.076	0.972	22 21.9	35	6	25	0.932	0.721	23 41.4	34	4
27	1.097	0.996	22 25.3	34	6	Aug. 1	0.915	0.706	23 33.3	33	4
March 6	1.116	1.017	22 30.5	33	6	8	0.899	0.693	23 24.1	32	4
13	1.133	-1.035	+22 37.1	-31	-7	15	0.884	-0.682	+23 13.5	+30	-4
20	1.147	1.047	22 45.2	29	7	22	0.870	0.674	23 1.5	29	4
27	1.158	1.054	22 54.0	27	7	30	0.858	0.668	22 48.0	27	4
April 3	1.165	1.056	23 3.2	24	7	Sept. 6	0.847	0.663	22 33.1	26	4
10	1.169	1.061	23 12.8	-20	7	13	0.838	0.659	22 16.8	24	4
17	1.169	-1.041	+23 22.3	+22	-7	20	0.830	-0.656	+21 59.1	+23	-4
24	1.165	1.026	23 31.2	26	7	27	0.824	0.655	21 40.0	+21	4
May 1	1.157	1.008	23 39.2	28	6	Dec. 1	0.826	0.707	17 51.0	-21	4
8	1.145	1.996	23 46.1	30	6	9	0.834	0.719	17 23.0	23	4
15	1.131	1.960	23 51.9	32	6	16	0.843	0.732	16 55.4	24	4
22	1.114	-1.933	+23 56.6	+34	-6	23	0.853	-0.746	+16 28.1	-26	-4
30	1.095	-1.905	+23 59.9	+35	-5	30	0.864	-0.761	+15 1.3	-27	-5

SATELLITE II.

Date, 1863.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.		Date, 1863.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
	Factor for x' .	Factor for y' .	P .	z .	y .		Factor for x' .	Factor for y' .	P .	z .	y .
Jan. 2	0.932	-0.711	+23 13.8	-42	-8	June 7	1.070	-0.791	+24 28.6	+46	-9
9	0.941	0.737	23 5.0	44	9	14	1.049	0.767	24 29.2	47	9
16	0.971	0.764	22 57.7	45	9	21	1.028	0.745	24 28.4	47	9
23	0.992	0.792	22 51.9	46	10	29	1.006	0.724	24 26.3	46	9
31	1.014	0.819	22 47.9	46	10	July 6	0.985	0.705	24 22.9	47	8
Feb. 7	1.037	-0.846	+22 45.8	-45	-10	13	0.965	-0.688	+24 18.3	+46	-8
14	1.059	0.872	22 45.7	44	10	20	0.946	0.674	24 12.3	47	8
21	1.081	0.897	22 47.6	43	11	27	0.927	0.662	24 5.0	43	8
28	1.101	0.918	22 51.4	41	11	Aug. 3	0.910	0.651	23 56.4	41	8
March 7	1.120	0.936	22 56.9	39	11	10	0.894	0.642	23 46.4	39	7
14	1.136	-0.950	+23 4.0	-36	-11	17	0.880	-0.634	+23 34.9	+37	-7
21	1.150	0.960	23 12.3	32	12	25	0.867	0.628	23 22.1	35	7
28	1.160	0.965	23 21.5	28	12	Sept. 1	0.856	0.624	23 7.8	33	7
April 4	1.166	0.964	23 31.2	23	12	8	0.845	0.622	22 52.0	31	7
12	1.169	0.958	23 40.9	-18	12	15	0.836	0.621	22 34.8	28	7
19	1.168	-0.947	+23 50.3	+23	-12	22	0.828	-0.621	+22 16.2	+26	-7
26	1.163	0.932	23 59.0	27	11	29	0.822	0.622	21 56.1	+23	7
May 3	1.154	0.913	24 6.9	32	11	Dec. 2	0.827	0.686	18 5.1	-23	8
10	1.142	0.891	24 13.7	36	11	9	0.834	0.699	17 36.4	26	8
17	1.126	0.867	24 19.4	39	10	16	0.843	0.713	17 7.9	28	9
24	1.109	-0.842	+24 23.8	+42	-10	23	0.854	-0.729	+16 39.6	-31	-9
31	1.090	-0.816	+24 26.8	+44	-10	31	0.866	-0.747	+16 11.4	-33	-9

JUPITER'S SATELLITES, 1863. 465

SATELLITE III.

Date, 1863.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.			
	Factor for x' .	Factor for y' .	p .	Disappearance.		Reappearance.	
				z .	y .	z .	y .
Jan. 6	0.943	-0.706	+22° 49.9	-58"	-12"	-35"	-12"
13	0.963	0.738	22 41.5	60	12	36	12
21	0.984	0.769	22 35.0	61	13	36	13
28	1.006	0.799	22 30.4	61	13	36	13
Feb. 4	1.028	0.826	22 27.7	61	14	36	14
11	1.051	-0.852	+22 27.1	-60	-14	-34	-14
18	1.073	0.878	22 28.4	58	15	32	15
25	1.094	0.899	22 31.5	55	15	28	15
March 5	1.113	0.918	22 36.2	51	15	24	15
12	1.130	0.935	22 42.5	45	15	-18	-15
19	1.145	-0.947	+22 50.3	-39	-16	..	..
26	1.157	0.954	22 59.0	32	16	..	..
April 2	1.165	0.955	23 8.3	24	16	..	..
9	1.169	0.950	23 17.9	-16	-16	..	..
16	1.169	0.941	23 27.1	..	..	+19	-16
24	1.165	-0.927	+23 35.8	..	..	+27	-16
May 1	1.157	0.909	23 43.8	..	..	34	15
8	1.145	0.887	23 50.8	..	..	41	15
15	1.131	0.863	23 56.6	+20	-14	47	14
22	1.114	0.837	24 1.3	26	14	52	14
29	1.095	-0.810	+24 4.7	+31	-14	+56	-14
June 5	1.075	0.784	24 6.8	34	13	58	13
13	1.054	0.759	24 7.7	37	13	60	13
20	1.033	0.735	24 7.5	39	12	61	12
27	1.012	0.713	24 5.9	40	12	62	12
July 4	0.991	-0.692	+24 2.9	+40	-12	+61	-12
11	0.970	0.673	23 58.7	40	11	60	11
18	0.951	0.656	23 53.3	39	11	59	11
25	0.932	0.641	23 46.6	38	11	57	11
Aug. 2	0.914	0.628	23 38.7	36	11	54	11
9	0.898	-0.618	+23 29.3	+33	-10	+51	-10
16	0.883	0.610	23 18.6	30	10	48	10
23	0.870	0.603	23 6.4	27	10	45	10
30	0.858	0.597	22 52.9	25	10	42	10
Sept. 7	0.847	0.593	22 37.9	22	10	38	10
14	0.837	-0.591	+22 21.4	+18	-10	+34	-10
21	0.829	0.590	22 3.5	..	..	30	10
28	0.823	0.590	21 44.1	..	..	+26	10
Dec. 2	0.826	0.649	17 59.9	-26	11	..	..
9	0.834	0.661	17 31.7	30	11	..	..
16	0.843	-0.674	+17 3.9	-34	-11	-17	-11
23	0.854	0.689	16 36.6	38	12	21	12
31	0.866	-0.705	+16 9.6	-41	-12	-25	-12

466 JUPITER'S SATELLITES, 1863.

SATELLITE IV.

Date, 1863.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.			
	Factor for x' .	Factor for y' .	p .	Disappearance.		Reappearance.	
				x .	y .	x .	y .

SATELLITE I.

COÖRDINATES IN THE MEAN APPARENT ELLIPSE, DESCRIBED BY THE SATELLITE, AND FOR THE MEAN DISTANCE OF JUPITER FROM THE SUN, FOR THE TIME (t) AFTER GEOCENTRIC SUPERIOR CONJUNCTION.

t	x'	y'	t	x'	y'	t	x'	y'
d h m			d h m			d h m		
0 0 0	+ 0.0	+ 6.6	0 5 20	+ 77.5	+ 4.7	0 10 40	+109.1	— 0.1
0 0 20	5.4	6.6	0 5 40	81.2	4.4	0 11 0	109.0	0.4
0 0 40	10.8	6.6	0 6 0	84.7	4.2	0 11 20	108.6	0.7
0 1 0	16.1	6.6	0 6 20	88.0	3.9	0 11 40	107.9	1.0
0 1 20	21.4	6.5	0 6 40	91.1	3.7	0 12 0	106.9	1.3
0 1 40	+ 26.6	+ 6.4	0 7 0	+ 94.0	+ 3.4	0 12 20	+105.7	— 1.7
0 2 0	31.8	6.3	0 7 20	96.6	3.1	0 12 40	104.2	2.0
0 2 20	36.9	6.2	0 7 40	99.0	2.8	0 13 0	102.5	2.3
0 2 40	42.0	6.1	0 8 0	101.1	2.5	0 13 20	100.5	2.6
0 3 0	46.9	6.0	0 8 20	103.0	2.2	0 13 40	98.3	2.9
0 3 20	+ 51.7	+ 5.8	0 8 40	+104.7	+ 1.9	0 14 0	+ 95.8	— 3.2
0 3 40	56.4	5.7	0 9 0	106.1	1.6	0 14 20	93.1	3.5
0 4 0	60.9	5.5	0 9 20	107.3	1.3	0 14 40	90.2	3.7
0 4 20	65.3	5.3	0 9 40	108.1	0.9	0 15 0	87.1	4.0
0 4 40	69.5	5.1	0 10 0	108.7	0.6	0 15 20	83.7	4.3
0 5 0	+ 73.6	+ 4.9	0 10 20	+109.1	+ 0.3	0 15 40	+ 80.1	— 4.5

JUPITER'S SATELLITES, 1863. 467

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE I.

<i>t</i>	<i>x'</i>	<i>y</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	<i>u</i>	<i>u</i>	d. h. m.	<i>u</i>	<i>u</i>	d. h. m.	<i>u</i>	<i>u</i>
0 16 0	+ 76.4	- 4.7	1 1 40	- 66.6	- 5.2	1 11 0	- 97.6	+ 3.0
0 16 20	72.5	5.0	1 2 0	70.8	5.0	1 11 20	95.1	3.3
0 16 40	68.4	5.2	1 2 20	74.8	4.8	1 11 40	92.3	3.5
0 17 0	64.1	5.4	1 2 40	78.6	4.6	1 12 0	89.3	3.8
0 17 20	59.6	5.5	1 3 0	82.2	4.4	1 12 20	86.1	4.1
0 17 40	+ 55.0	- 5.7	1 3 20	- 85.6	- 4.1	1 12 40	- 82.7	+ 4.3
0 18 0	50.3	5.9	1 3 40	88.9	3.8	1 13 0	79.1	4.6
0 18 20	45.5	6.0	1 4 0	91.9	3.6	1 13 20	75.3	4.8
0 18 40	40.5	6.1	1 4 20	94.7	3.3	1 13 40	71.3	5.0
0 19 0	35.3	6.3	1 4 40	97.3	3.0	1 14 0	67.1	5.3
0 19 20	+ 30.4	- 6.4	1 5 0	- 99.6	- 2.7	1 14 20	- 62.8	+ 5.4
0 19 40	25.3	6.4	1 5 20	101.7	2.4	1 14 40	58.3	5.6
0 20 0	19.9	6.5	1 5 40	103.5	2.1	1 15 0	53.7	5.8
0 20 20	14.6	6.6	1 6 0	105.1	1.8	1 15 20	49.0	5.9
0 20 40	9.2	6.6	1 6 20	106.4	1.5	1 15 40	44.1	6.1
0 21 0	+ 3.8	- 6.6	1 6 40	- 107.5	- 1.2	1 16 0	- 39.1	+ 6.2
0 21 20	- 1.5	6.6	1 7 0	108.3	0.8	1 16 20	34.0	6.3
0 21 40	6.9	6.6	1 7 20	108.8	0.5	1 16 40	28.9	6.4
0 22 0	12.3	6.6	1 7 40	109.1	- 0.2	1 17 0	23.7	6.5
0 22 20	17.6	6.5	1 8 0	109.1	+ 0.1	1 17 20	18.4	6.5
0 22 40	- 22.9	- 6.5	1 8 20	- 108.9	+ 0.5	1 17 40	- 13.0	+ 6.6
0 23 0	28.1	6.4	1 8 40	108.4	0.8	1 18 0	7.7	6.6
0 23 20	33.3	6.3	1 9 0	107.6	1.1	1 18 20	- 2.3	6.6
0 23 40	38.4	6.2	1 9 20	106.6	1.4	1 18 40	+ 3.1	6.6
1 0 0	43.4	6.1	1 9 40	105.3	1.8	1 19 0	8.5	6.6
1 0 20	- 48.3	- 5.9	1 10 0	- 103.8	+ 2.1	1 19 20	+ 13.8	+ 6.6
1 0 40	53.1	5.8	1 10 20	102.0	2.4	1 19 40	19.1	6.5
1 1 0	57.7	5.6	1 10 40	- 99.9	+ 2.7	1 20 0	+ 24.4	+ 6.5
1 1 20	- 62.2	- 5.4						

SATELLITE II.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	<i>u</i>	<i>u</i>	d. h. m.	<i>u</i>	<i>u</i>	d. h. m.	<i>u</i>	<i>u</i>
0 0 0	+ 0.0	+ 12.2	0 10 40	+ 122.9	+ 8.6	0 21 20	+ 173.8	- 0.0
0 0 40	8.5	12.2	0 11 20	128.8	8.2	0 22 0	173.6	0.6
0 1 20	17.0	12.1	0 12 0	134.4	7.7	0 22 40	172.9	1.2
0 2 0	25.5	12.1	0 12 40	139.6	7.3	0 23 20	171.8	1.8
0 2 40	33.9	12.0	0 13 20	144.5	6.8	1 0 0	170.4	2.4
0 3 20	+ 42.2	+ 11.8	0 14 0	+ 149.0	+ 6.3	1 0 40	+ 168.5	- 3.0
0 4 0	50.5	11.7	0 14 40	153.2	5.7	1 1 20	166.2	3.5
0 4 40	58.6	11.5	0 15 20	157.0	5.2	1 2 0	163.5	4.1
0 5 20	66.5	11.3	0 16 0	160.5	4.7	1 2 40	160.4	4.7
0 6 0	74.3	11.0	0 16 40	163.6	4.1	1 3 20	157.0	5.2
0 6 40	+ 81.9	+ 10.8	0 17 20	+ 166.3	+ 3.5	1 4 0	+ 153.2	- 5.8
0 7 20	89.4	10.5	0 18 0	168.6	3.0	1 4 40	149.0	6.3
0 8 0	96.6	10.1	0 18 40	170.5	2.4	1 5 20	144.4	6.8
0 8 40	103.6	9.8	0 19 20	171.9	1.8	1 6 0	139.5	7.3
0 9 20	110.3	9.4	0 20 0	172.9	1.2	1 6 40	134.2	7.7
0 10 0	+ 116.7	+ 9.0	0 20 40	+ 173.6	+ 0.6	1 7 20	+ 128.6	- 8.2

468 JUPITER'S SATELLITES, 1863.

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE II.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	°	'	d. h. m.	°	'	d. h. m.	°	'
1 8 0	+122.7	- 8.6	2 3 20	-103.7	- 9.8	2 22 0	-156.9	+ 5.2
1 8 40	116.5	9.0	2 4 0	110.4	9.4	2 22 40	153.0	5.8
1 9 20	110.1	9.4	2 4 40	116.8	9.0	2 23 20	148.8	6.3
1 10 0	103.4	9.8	2 5 20	123.0	8.6	3 0 0	144.2	6.8
1 10 40	96.4	10.1	2 6 0	128.9	8.2	3 0 40	139.3	7.3
1 11 20	+ 89.2	-10.5	2 6 40	-134.5	- 7.7	3 1 20	-134.1	+ 7.8
1 12 0	81.7	10.8	2 7 20	139.7	7.2	3 2 0	128.5	8.2
1 12 40	74.1	11.0	2 8 0	144.6	6.7	3 2 40	122.6	8.6
1 13 20	66.3	11.3	2 8 40	149.1	6.2	3 3 20	116.4	9.0
1 14 0	58.3	11.5	2 9 20	153.3	5.7	3 4 0	109.9	9.4
1 14 40	+ 50.2	-11.7	2 10 0	-157.1	- 5.2	3 4 40	-103.1	+ 9.8
1 15 20	42.0	11.8	2 10 40	160.6	4.6	3 5 20	96.1	10.1
1 16 0	33.7	12.0	2 11 20	163.7	4.1	3 6 0	88.9	10.5
1 16 40	25.3	12.1	2 12 0	166.4	3.5	3 6 40	81.5	10.8
1 17 20	16.8	12.1	2 12 40	168.6	2.9	3 7 20	73.9	11.0
1 18 0	+ 8.3	-12.2	2 13 20	-170.4	- 2.3	3 8 0	- 66.1	+11.3
1 18 40	- 0.2	12.2	2 14 0	171.9	1.8	3 8 40	58.1	11.5
1 19 20	8.8	12.2	2 14 40	173.0	1.2	3 9 20	50.0	11.7
1 20 0	17.3	12.1	2 15 20	173.6	- 0.6	3 10 0	41.8	11.8
1 20 40	25.7	12.1	2 16 0	173.8	+ 0.0	3 10 40	33.5	12.0
1 21 20	- 34.1	-12.0	2 16 40	-173.6	+ 0.6	3 11 20	- 25.1	+12.1
1 22 0	42.4	11.8	2 17 20	172.9	1.2	3 12 0	16.6	12.1
1 22 40	50.6	11.7	2 18 0	171.8	1.8	3 12 40	- 8.1	12.2
1 23 20	58.7	11.5	2 18 40	170.3	2.4	3 13 20	+ 0.4	12.2
2 0 0	66.7	11.3	2 19 20	168.4	3.0	3 14 0	9.0	12.2
2 0 40	- 74.5	-11.0	2 20 0	-166.2	+ 3.5	3 14 40	+ 17.5	+12.1
2 1 20	82.1	10.7	2 20 40	163.5	4.1	3 15 20	26.0	12.1
2 2 0	89.5	10.4	2 21 20	-160.4	+ 4.7	3 16 0	+ 34.4	+12.0
2 2 40	- 96.7	-10.1						

SATELLITE III.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	°	'	d. h. m.	°	'	d. h. m.	°	'
0 0 0	+ 0.0	+17.4	0 21 20	+194.7	+12.4	1 18 40	+277.2	+ 0.2
0 1 20	13.5	17.4	0 22 40	204.1	11.8	1 20 0	277.0	- 0.6
0 2 40	26.9	17.3	1 0 0	213.0	11.1	1 21 20	276.2	1.5
0 4 0	40.3	17.2	1 1 20	221.4	10.5	1 22 40	274.7	2.3
0 5 20	53.6	17.1	1 2 40	229.3	9.8	2 0 0	272.6	3.2
0 6 40	+ 66.8	+16.9	1 4 0	+236.6	+ 9.1	2 1 20	+269.8	- 4.0
0 8 0	79.8	16.7	1 5 20	243.3	8.3	2 2 40	266.4	4.8
0 9 20	92.7	16.4	1 6 40	249.5	7.6	2 4 0	262.3	5.6
0 10 40	105.3	16.1	1 8 0	255.1	6.8	2 5 20	257.6	6.4
0 12 0	117.6	15.8	1 9 20	260.0	6.0	2 6 40	252.3	7.2
0 13 20	+129.7	+15.4	1 10 40	+264.3	+ 5.2	2 8 0	+246.4	- 8.0
0 14 40	141.5	15.0	1 12 0	268.0	4.4	2 9 20	240.0	8.7
0 16 0	153.0	14.5	1 13 20	271.1	3.6	2 10 40	233.0	9.4
0 17 20	164.1	14.0	1 14 40	273.6	2.7	2 12 0	225.4	10.1
0 18 40	174.7	13.5	1 16 0	276.5	1.9	2 13 20	217.3	10.8
0 20 0	+184.9	+13.0	1 17 20	+276.7	+ 1.1	2 14 40	+208.6	-11.5

JUPITER'S SATELLITES, 1863. 469

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE III.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	"	"	d. h. m.	"	"	d. h. m.	"	"
2 16 0	+199.5	-12.1	4 6 40	-158.4	-14.3	5 20 0	-255.1	+ 6.8
2 17 20	189.9	12.7	4 8 0	169.3	13.8	5 21 20	249.5	7.6
2 18 40	179.9	13.3	4 9 20	179.8	13.3	5 22 40	243.3	8.3
2 20 0	169.4	13.8	4 10 40	189.9	12.7	6 0 0	236.6	9.1
2 21 20	158.5	14.3	4 12 0	199.5	12.1	6 1 20	229.3	9.8
2 22 40	+147.2	-14.8	4 13 20	-208.6	-11.5	6 2 40	-221.4	+10.5
3 0 0	135.6	15.2	4 14 40	217.3	10.8	6 4 0	213.0	11.1
3 1 20	123.7	15.6	4 16 0	225.5	10.1	6 5 20	204.1	11.8
3 2 40	111.5	16.0	4 17 20	233.1	9.4	6 6 40	194.7	12.4
3 4 0	99.0	16.3	4 18 40	240.1	8.7	6 8 0	184.9	13.0
3 5 20	+ 86.3	-16.6	4 20 0	-246.5	- 8.0	6 9 20	-174.7	+13.5
3 6 40	73.3	16.8	4 21 20	252.3	7.2	6 10 40	164.1	14.0
3 8 0	60.2	17.0	4 22 40	257.6	6.4	6 12 0	153.0	14.5
3 9 20	47.0	17.2	5 0 0	262.3	5.6	6 13 20	141.5	15.0
3 10 40	33.6	17.3	5 1 20	266.4	4.8	6 14 40	129.7	15.4
3 12 0	+ 20.2	-17.4	5 2 40	-269.8	- 4.0	6 16 0	-117.6	+15.8
3 13 20	+ 6.7	17.4	5 4 0	272.6	3.2	6 17 20	105.2	16.1
3 14 40	- 6.8	17.4	5 5 20	274.7	2.3	6 18 40	92.6	16.4
3 16 0	20.3	17.4	5 6 40	276.2	1.5	6 20 0	79.8	16.7
3 17 20	33.7	17.3	5 8 0	277.0	- 0.6	6 21 20	66.8	16.9
3 18 40	- 47.1	-17.2	5 9 20	-277.2	+ 0.2	6 22 40	- 53.6	+17.1
3 20 0	60.3	17.0	5 10 40	276.7	1.1	7 0 0	40.3	17.2
3 21 20	73.4	16.8	5 12 0	275.5	1.9	7 1 20	26.9	17.3
3 22 40	86.3	16.6	5 13 20	273.7	2.7	7 2 40	- 13.4	17.4
4 0 0	99.0	16.3	5 14 40	271.2	3.6	7 4 0	+ 0.1	17.4
4 1 20	-111.5	-16.0	5 16 0	-268.1	+ 4.4	7 5 20	+ 13.6	+17.4
4 2 40	123.7	15.6	5 17 20	264.4	5.2	7 6 40	27.0	17.3
4 4 0	135.7	15.2	5 18 40	-260.1	+ 6.0	7 8 0	+ 40.4	+17.2
4 5 20	-147.2	-14.8						

SATELLITE IV.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h.	"	"	d. h.	"	"	d. h.	"	"
0 0	+ 0.0	+34.8	2 0	+332.3	+25.5	4 0	+486.2	+ 2.5
0 3	22.8	34.8	2 3	348.6	24.3	4 3	487.3	+ 0.8
0 6	45.6	34.7	2 6	364.1	23.1	4 6	487.3	- 0.8
0 9	68.3	34.5	2 9	378.9	21.9	4 9	486.3	2.4
0 12	90.9	34.2	2 12	392.9	20.6	4 12	484.2	4.1
0 15	+113.2	+33.9	2 15	+406.0	+19.3	4 15	+480.9	- 5.7
0 18	135.3	33.5	2 18	418.2	17.9	4 18	476.6	7.3
0 21	157.1	33.0	2 21	429.5	16.5	4 21	471.3	8.9
1 0	178.5	32.4	3 0	439.8	15.0	5 0	465.0	10.4
1 3	199.6	31.8	3 3	449.1	13.5	5 3	457.7	19.0
1 6	+220.3	+31.1	3 6	+457.5	+12.0	5 6	+449.3	-13.5
1 9	240.4	30.3	3 9	464.9	10.5	5 9	439.9	15.0
1 12	260.0	29.5	3 12	471.3	8.9	5 12	429.6	16.4
1 15	279.0	28.6	3 15	476.6	7.3	5 15	418.4	17.9
1 18	297.4	27.6	3 18	480.8	5.7	5 18	406.2	19.3
1 21	+315.2	+26.6	3 21	+484.0	+ 4.1	5 21	+393.1	-20.6

470 JUPITER'S SATELLITES, 1863.

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE IV.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h.			d. h.			d. h.		
6 0	+379.2	-21.9	9 18	-240.1	-30.3	13 12	-457.6	+12.0
6 3	364.4	23.1	9 21	259.7	29.5	13 15	449.3	13.5
6 6	348.8	24.3	10 0	278.7	28.6	13 18	440.0	15.0
6 9	332.5	25.5	10 3	297.2	27.6	13 21	429.7	16.4
6 12	315.4	26.6	10 6	315.0	26.6	14 0	418.5	17.8
6 15	+297.6	-27.6	10 9	-332.1	-25.5	14 3	-406.3	+19.2
6 18	279.2	28.5	10 12	348.4	24.4	14 6	393.2	20.6
6 21	260.2	29.4	10 15	363.9	23.2	14 9	379.3	21.9
7 0	240.6	30.3	10 18	378.7	21.9	14 12	364.6	23.1
7 3	220.5	31.1	10 21	392.7	20.6	14 15	349.1	24.3
7 6	+199.9	-31.8	11 0	-405.8	-19.3	14 18	-332.8	+25.4
7 9	178.8	32.4	11 3	418.0	17.9	14 21	315.7	26.5
7 12	157.4	33.0	11 6	429.3	16.5	15 0	298.0	27.5
7 15	135.6	33.5	11 9	439.6	15.0	15 3	279.6	28.5
7 18	113.5	33.9	11 12	449.0	13.5	15 6	260.5	29.4
7 21	+ 91.2	-34.2	11 15	-457.4	-12.0	15 9	-240.9	+30.3
8 0	68.7	34.5	11 18	464.8	10.5	15 12	220.8	31.1
8 3	46.0	34.7	11 21	471.2	8.9	15 15	200.2	31.8
8 6	23.2	34.8	12 0	476.5	7.3	15 18	179.3	32.4
8 9	+ 0.3	34.8	12 3	480.8	5.7	15 21	157.7	33.0
8 12	- 22.5	-34.8	12 6	-484.0	- 4.1	16 0	-135.9	+33.5
8 15	45.3	34.7	12 9	486.2	2.5	16 3	113.8	33.9
8 18	68.0	34.5	12 12	487.3	- 0.8	16 6	91.5	34.2
8 21	90.5	34.2	12 15	487.3	+ 0.8	16 9	69.0	34.5
9 0	112.9	33.9	12 18	486.3	2.4	16 12	46.3	34.7
9 3	-135.0	-33.5	12 21	-484.2	+ 4.0	16 15	- 23.5	+34.8
9 6	156.8	33.0	13 0	480.9	5.7	16 18	- 0.6	34.8
9 9	178.2	32.4	13 3	476.6	7.3	16 21	+ 22.2	34.8
9 12	199.3	31.8	13 6	471.3	8.9	17 0	+ 45.0	+34.7
9 15	-220.0	-31.1	13 9	-465.0	+10.5			

THE APPARENT ELEMENTS OF SATURN'S RING.

Sidereal Date Oh.	a Outer Major Axis.	b Outer Minor Axis.	p Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	l The Elevation of the Earth above the Plane of the Ring.	l' The Elevation of the Sun above the Plane of the Ring.	u u' Earth's Longitude from Saturn counted on Plane of Ring from the Ring's As- cending Node on	
						Equator.	Ecliptic.
0	40.03	4.30	-3° 33.4	+ 6° 9.9	+3° 28.9	239° 56.0	196° 44.0
20	41.43	4.43	3 32.3	6 8.7	3 47.0	240 6.1	196 54.3
40	42.70	4.33	3 35.3	5 48.9	4 5.0	239 38.4	196 26.7
60	43.60	3.98	3 41.7	5 14.1	4 22.9	238 38.7	195 27.0
80	43.96	3.47	3 50.1	4 31.3	4 40.8	237 19.6	194 8.0
100	43.70	2.92	3 58.6	3 49.6	4 58.7	235 58.3	192 46.8
120	42.88	2.47	4 5.5	3 17.5	5 16.5	234 51.5	191 40.2
140	41.67	2.20	4 9.5	3 1.1	5 34.2	234 12.2	191 1.0
160	40.28	2.15	4 10.0	3 3.4	5 51.9	234 7.2	190 56.0
180	38.90	2.32	4 6.8	3 24.3	6 9.5	234 37.6	191 26.5
200	37.67	2.65	4 0.4	4 1.4	6 27.1	235 40.4	192 29.5
220	36.67	3.11	3 51.0	4 51.5	6 44.6	237 10.3	193 59.5
240	35.95	3.66	3 39.2	5 50.7	7 2.0	239 1.3	195 50.6
260	35.54	4.28	3 25.7	6 55.0	7 19.4	241 6.6	197 56.0
280	35.45	4.94	3 11.3	8 0.4	7 36.7	243 18.9	200 8.4
300	35.70	5.62	2 56.7	9 2.8	7 54.0	245 30.7	202 20.2
320	36.28	6.28	2 42.8	9 58.4	8 11.2	247 33.7	204 23.3
340	37.16	6.91	2 30.7	10 43.4	8 28.3	249 19.2	206 9.0
360	38.32	7.47	2 21.5	11 14.6	8 45.3	250 38.8	207 28.6
366	38.71	7.62	-2 19.5	+11 20.8	+8 50.3	250 56.4	207 46.3

Factor which is to be multiplied by a and b to obtain the axes of

The inner ellipse of the outer Ring = 0.8801 log. Factor = 9.9445

The outer ellipse of the inner Ring = 0.8599 " = 9.9344

The inner ellipse of the inner Ring = 0.6650 " = 9.8228

The inner ellipse of Bond's dusky Ring = 0.5486 " = 9.7392

NOTE. — The sign of l indicates whether the visible surface of the Ring is northern or southern.

THE APPARENT DISCS OF VENUS AND MARS.

The Versed Sines of their Illuminated Portions, divided by their Apparent Diameters.

1863.		Venus.	Mars.	1863.		Venus.	Mars.
January	15	0.989	0.883	July	15	0.518	0.982
February	15	0.964	0.891	August	15	0.325	0.993
March	15	0.924	0.907	September	15	0.066	0.999
April	15	0.859	0.927	October	15	0.092	1.000
May	15	0.772	0.948	November	15	0.355	0.994
June	15	0.657	0.967	December	15	0.535	0.983

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		°				°
Jan.	1	10	-	♂	♂	♂	♂	♂	♂
	2	4	13	♂	♂	♂	♂	♂	♂
	5	22	4	♂	♂	♂	♂	♂	♂
	11	3	-	♂	♂	♂	♂	♂	♂
	11	6	6	♂	♂	♂	♂	♂	♂
	12	17	8	♂	♂	♂	♂	♂	♂
	15	7	-	♂	♂	♂	♂	♂	♂
	16	5	8	♂	♂	♂	♂	♂	♂
	19	18	12	♂	♂	♂	♂	♂	♂
	20	7	56	♂	♂	♂	♂	♂	♂
	23	11	52	♂	♂	♂	♂	♂	♂
	24	21	47	♂	♂	♂	♂	♂	♂
	25	4	26	♂	♂	♂	♂	♂	♂
	25	9	21	♂	♂	♂	♂	♂	♂
	26	0	41	♂	♂	♂	♂	♂	♂
	29	9	5	♂	♂	♂	♂	♂	♂
	29	11	32	♂	♂	♂	♂	♂	♂
	31	3	58	♂	♂	♂	♂	♂	♂
Feb.	1	20	55	♂	♂	♂	♂	♂	♂
	3	0	-	♂	♂	♂	♂	♂	♂
	7	10	37	♂	♂	♂	♂	♂	♂
	8	19	15	♂	♂	♂	♂	♂	♂
	9	1	2	♂	♂	♂	♂	♂	♂
	9	15	51	♂	♂	♂	♂	♂	♂
	11	1	-	♂	♂	♂	♂	♂	♂
	16	10	25	♂	♂	♂	♂	♂	♂
	18	21	10	♂	♂	♂	♂	♂	♂
	19	23	1	♂	♂	♂	♂	♂	♂
	21	16	59	♂	♂	♂	♂	♂	♂
	22	18	-	♂	♂	♂	♂	♂	♂
	23	15	27	♂	♂	♂	♂	♂	♂
	25	15	55	♂	♂	♂	♂	♂	♂
Mar.	3	9	37	♂	♂	♂	♂	♂	♂
	4	7	6	♂	♂	♂	♂	♂	♂
	6	13	51	♂	♂	♂	♂	♂	♂
	7	20	14	♂	♂	♂	♂	♂	♂
	8	4	49	♂	♂	♂	♂	♂	♂
	14	11	13	♂	♂	♂	♂	♂	♂
	17	2	52	♂	♂	♂	♂	♂	♂
	19	10	27	♂	♂	♂	♂	♂	♂
	20	9	22	♂	♂	♂	♂	♂	♂
	20	22	42	♂	♂	♂	♂	♂	♂
	22	13	57	♂	♂	♂	♂	♂	♂
	23	23	11	♂	♂	♂	♂	♂	♂
	24	9	16	♂	♂	♂	♂	♂	♂
	25	0	50	♂	♂	♂	♂	♂	♂
	31	7	7	♂	♂	♂	♂	♂	♂
April	2	18	12	♂	♂	♂	♂	♂	♂
	3	21	20	♂	♂	♂	♂	♂	♂
	4	7	17	♂	♂	♂	♂	♂	♂
	6	21	43	♂	♂	♂	♂	♂	♂
April	12	4	33	♂	♂	♂	♂	♂	♂
	15	20	24	♂	♂	♂	♂	♂	♂
	17	7	9	♂	♂	♂	♂	♂	♂
	20	1	22	♂	♂	♂	♂	♂	♂
	20	1	47	♂	♂	♂	♂	♂	♂
	21	10	59	♂	♂	♂	♂	♂	♂
	22	4	53	♂	♂	♂	♂	♂	♂
	22	21	3	♂	♂	♂	♂	♂	♂
	27	10	48	♂	♂	♂	♂	♂	♂
	30	0	32	♂	♂	♂	♂	♂	♂
May	1	10	58	♂	♂	♂	♂	♂	♂
	3	13	-	♂	♂	♂	♂	♂	♂
	4	18	40	♂	♂	♂	♂	♂	♂
	7	18	31	♂	♂	♂	♂	♂	♂
	13	4	16	♂	♂	♂	♂	♂	♂
	16	-	-	♂	♂	♂	♂	♂	♂
	18	17	24	♂	♂	♂	♂	♂	♂
	18	21	19	♂	♂	♂	♂	♂	♂
	18	22	55	♂	♂	♂	♂	♂	♂
	20	9	49	♂	♂	♂	♂	♂	♂
	21	1	22	♂	♂	♂	♂	♂	♂
	25	19	-	♂	♂	♂	♂	♂	♂
	27	8	27	♂	♂	♂	♂	♂	♂
	28	17	4	♂	♂	♂	♂	♂	♂
	31	6	21	♂	♂	♂	♂	♂	♂
June	31	18	27	♂	♂	♂	♂	♂	♂
	1	-	-	♂	♂	♂	♂	♂	♂
	1	8	-	♂	♂	♂	♂	♂	♂
	2	4	33	♂	♂	♂	♂	♂	♂
	9	1	-	♂	♂	♂	♂	♂	♂
	9	10	49	♂	♂	♂	♂	♂	♂
	10	10	26	♂	♂	♂	♂	♂	♂
	11	14	57	♂	♂	♂	♂	♂	♂
	12	23	5	♂	♂	♂	♂	♂	♂
	14	14	-	♂	♂	♂	♂	♂	♂
	15	7	4	♂	♂	♂	♂	♂	♂
	15	7	9	♂	♂	♂	♂	♂	♂
	18	21	47	♂	♂	♂	♂	♂	♂
	19	17	43	♂	♂	♂	♂	♂	♂
	20	6	28	♂	♂	♂	♂	♂	♂
	21	5	54	♂	♂	♂	♂	♂	♂
	23	17	14	♂	♂	♂	♂	♂	♂
	24	17	48	♂	♂	♂	♂	♂	♂
	25	1	33	♂	♂	♂	♂	♂	♂
	30	20	35	♂	♂	♂	♂	♂	♂
July	3	2	-	♂	♂	♂	♂	♂	♂
	6	6	15	♂	♂	♂	♂	♂	♂
	6	17	24	♂	♂	♂	♂	♂	♂
	9	19	-	♂	♂	♂	♂	♂	♂
	10	15	12	♂	♂	♂	♂	♂	♂
	12	16	9	♂	♂	♂	♂	♂	♂

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

[illegible]

LATITUDES AND LONGITUDES OF THE PRINCIPAL OBSERVATORIES.

- Abo.** N. Lat. $60^{\circ} 26' 56''.8 \pm 0''.11$. ARGELANDER, *Obs. Astron.*, I. p. xxi.
 Long. E. from Paris, $1^h 19^m 47''.3$. *Astr. Nachr.*, IX. 264.
 This Observatory was abandoned, and the instruments transferred, together with the University of Finland, to Helsingfors, in consequence of the great fire of 1827, by which the University buildings, library, &c. were destroyed.
- Albany.** N. Lat. $42^{\circ} 39' 50'' \pm 2''$. } GOULD, *Astr. Journal*,
 Long. E. from Washington, $0^h 13^m 12''.6 \pm 0''.2$. } V. 144.
- Altona.** N. Lat. $53^{\circ} 32' 45''.27$. GAUSS, *Bestimmung des Breiten-Unterschiedes zwischen den Sternwarten von Göttingen und Altona*, p. 71. In the edition of SCHUMACHER's *Hülftafeln*, published by WARNSTORFF, Altona, 1845, the latitude of Altona is given, p. 114, as $+53^{\circ} 32' 45''.7$.
 Long. E. from Greenwich, $0^h 39^m 46''.151 \pm 0''.042$. STRUVE, *Expéd. Chronomet. exécutée in 1844, entre Altona et Greenwich*, p. 206.
- Ann Arbor.** . . . N. Lat. $42^{\circ} 16' 48''$. BRÜNNOW, *Astr. Journal*, V. 112.
 Long. W. from Washington, $0^h 26^m 41''.0$. BRÜNNOW, *Astr. Journal*, V. 145.
- Athens.** N. Lat. $37^{\circ} 58' 20'' \pm 1''$. BOURIS, *Astr. Nachr.*, XXXIII. 197.
 Long. E. from Paris, $1^h 25^m 34''.23 \pm 1''$. *Ergänzungs-Heft zu den Astr. Nachr.*, 1849, p. 151. This longitude was obtained from moon-culminating stars observed on ten nights at Athens and Hamburg. The result of a series observed at Athens and Copenhagen gave the longitude of Athens $6''.84$ farther East, but this series was rejected. *Ibid.*, pp. 150, 151, 158. Diminishing the E. longitude of Hamburg in conformity with STRUVE's chronometric determination, we have for the longitude of the meridian-circle $1^h 25^m 33''.73 \pm 1''$.
 The centre of the Observatory is $0''.19$ W. from the meridian-circle, *Erg.-Heft z. d. Astr. Nachr.*, p. 152.
- Berlin.** N. Lat. $52^{\circ} 30' 16''.68 \pm 0''.2$. ENCKE, *Astr. Nachr.*, XXIII. 372.
 For the Longitude of the centre of the Observatory, we have
- | | | |
|---------------------------|-----------------------------|-----------------------------------|
| Berlin E. from Altona, | $0^h 13^m 48''.78 \pm 0.03$ | <i>Berl. Astr. Jahrb.</i> , 1839, |
| Altona E. from Greenwich, | $0^h 39^m 46''.15$ | [p. 275. |
| Berlin " " | $0^h 53^m 34''.93$ | |

The old Observatory was situated $0^{\circ} 56''.72$ North (*Berl. Astr. Jahrb.*, 1839, p. 242; *Astr. Nachr.*, XXIII. 370), and $0^{\circ}.39$ West (*Ibid.*, pp. 261, 265), of the new one. Hence we have for the old Berlin Observatory,

N. Lat. $52^{\circ} 31' 13''.4$.

Long. E. from Greenwich, $0^h 53^m 34^s.54$.

Bilk. N. Lat. $51^{\circ} 12' 25''$. *Astr. Nachr.*, XXVII. 300.
Long. W. from Berlin, $0^h 26^m 30^s$. *Ibid.*

Bonn. N. Lat. $50^{\circ} 43' 45''.0$. } Orally communicated by Prof. ARGE-
Long. E. from Paris, $0^h 19^m 3^s$. } LANDER to the compiler.

The provisional Observatory on the *Alter Zoll*, in which were made the observations published in Vol. I. of the Bonn series, was situated in

N. Lat. $50^{\circ} 44' 9''$.

Long. E. from Paris, $0^h 19^m 5^s.5$. *Bonn Astr. Beob.*, I. p. i.

Breslau. N. Lat. $51^{\circ} 6' 56''$. (MS. communication from Professor BOGUSLAWSKI to Professor ENCKE.) *Berl. Astr. Jahrb.*, 1852, p. 289. The value given in the *Berl. Jahrb.* previously to 1851, was $51^{\circ} 6' 30''.0$.
The Longitude given in the table is derived from a mean of four determinations of the longitude E. from Paris, viz.:—

Triangulation in 1805 (fire-signals), <i>Astr. Nachr.</i> , XVI. 371,	$0^h 58^m 48^s.6$
STECZKOWSKI (6 star-immersions), <i>Ibid.</i> ,	48.17
HANSEN (occultations), <i>Astr. Nachr.</i> , XVII. 170,	48.74
ERMAN and PETERSEN (meteors), <i>Astr. Nachr.</i> , XIX. 27,	48.67
Mean, Breslau E. from Paris,	$0^h 58^m 48^s.54$

Brussels. N. Lat. $50^{\circ} 51' 10''.7$. *Annales de l'Obs. de Bruxelles*, 1837, p. 264.
Long. E. from Greenwich, $0^h 17^m 27^s.6$. QUETELET, *Mém. de l'Acad. R. de Bruxelles*, XVI. 18.

Cambridge (Eng.). N. Lat. $52^{\circ} 12' 51''.76$. *Camb. Phil. Trans.*, V. 279.
Long. E. from Greenwich, $0^h 0^m 23^s.54$. *Ibid.*, III. 168.

Cambridge (Mass.). N. Lat. $42^{\circ} 22' 48''.6$. PEIRCE, *Mem. Amer. Acad.*, N. S., II. 203.
Long. by the telegraphic determinations of the U. S. Coast-Survey, Cambridge E. from Stuyvesant Garden, N. Y.,

By 34 sets of clock-signals,	$0^h 11^m 26^s.10$
“ 10 “ “ star-signals (Western),	26.13
“ 24 “ “ “ (exchanged E. and W.),	25.96
“ 17 “ “ “ (Eastern),	26.18
Mean,	$0^h 11^m 26^s.09$
Geodetic reduction to dome of Cambridge Observatory,	—0.02
Stuyvesant Garden E. of Jersey City (geodetic),	$0^h 11^m 26^s.07$
Cambridge E. from C. S. Station, Jersey City,	$0^h 11^m 38^s.00$
Jersey City E. from Washington (see Philadelphia),	$0^h 12^m 3^s.54$
Cambridge (dome) E. from Washington,	$0^h 23^m 41^s.54$

Cape of Good Hope. S. Lat. $33^{\circ} 56' 3''$. HENDERSON, *Mem. R. Astr. Soc.*, VI. 130.

Long. E. from Greenwich,

By Greenwich Observations, $1^{\text{h}} 13^{\text{m}} 56.1$ *Ibid.*, p. 126.

" Cambridge " 55.04 " p. 127.

" Åbo " 58.56 " p. 128.

" Edinburgh " 54.2 " p. 129.

Mean, $1^{\text{h}} 13^{\text{m}} 56.0$

Christiania. . . N. Lat. $59^{\circ} 54' 43''.7$.
Long. E. from Paris, $0^{\text{h}} 33^{\text{m}} 33''.3$. } *Astr. Journal*, II. 173.

Cincinnati. . . N. Lat. $39^{\circ} 5' 54'$. *Astr. Nachr.*, XXIII. 313.
Long. W. from Washington, $0^{\text{h}} 29^{\text{m}} 46''.85$. (U. S. Coast-Survey.) *Proc. Amer. Assoc. for Adv. Science*, Cincinnati, 1851, p. 118.

Copenhagen. . . By Copenhagen Observatory is usually understood the "Round Tower" of the University. The new instruments are, however, mounted in a temporary wooden building known as "Holstens Bastion." (See *Astr. Nachr.*, XIX. 119).

N. Lat. of the Round Tower, $55^{\circ} 40' 53''$. *Astr. Nachr.*, V. 366.

For the Longitude,

Holstens Bastion E. from Altona,	
HANSEN (<i>Astr. Nachr.</i> , VIII. 281),	$0^{\text{h}} 10^{\text{m}} 32.585$ (139.88)
SCHUMACHER (<i>Astr. Nachr.</i> , IX. 463),	32.565 (19.42)
Mean,	$10^{\text{m}} 32.583$
Altona E. from Greenwich,	$39^{\circ} 46.151$
Holstens Bastion E. from Greenwich,	$50^{\circ} 18.734$
Round Tower E. from Holstens Bastion (WURM, <i>Astr. Nachr.</i> , III. 438; V. 337),	0.57
Round Tower E. from Greenwich,	$0^{\text{h}} 50^{\text{m}} 19.30$

Cracow. . . . N. Lat. $50^{\circ} 3' 50''.0 \pm 0.09$. WEISSE, *Astr. Nachr.*, VIII. 175; XVI. 256.

Longitude E. from Paris,

Mean of 19 obs. by WURM (*Astr. Nachr.*, VII. 458, VIII. 358), (6 of the 25 being rejected), $1^{\text{h}} 10^{\text{m}} 28.986 \pm 0.461$

Mean of 25 obs. by STECKOWSKI (*Astr. Nachr.*, XVI. 352), 30.221 ± 0.301

Mean of 4 obs. by STECKOWSKI (*Astr. Nachr.*, XVIII. 332), 29.760 ± 0.085

Mean of 16 obs. of three occultations (STECKOWSKI, *Astr. Nachr.*, X. 232), 30.95 ± 0.253

Assigning to each of these determinations a weight proportional to the number of observations from which it was derived, we obtain the mean,

Cracow E. from Paris, $1^{\text{h}} 10^{\text{m}} 29.78$

Dorpat.	N. Lat. 58° 22' 47".40 ± 0".05.	STRUVE, <i>Posit. Med.</i> , p. xl.
	Long. E. from Paris, 1 ^h 37 ^m 32".70	WURM, <i>Astr. Nachr.</i> , III. 437.
		BESSEL, " III. 46.
	Mean,	1 37 33.1
Dublin.	N. Lat. 53° 23' 13".	
	Long. W. from Greenwich, 0 ^h 25 ^m 22".	<i>Astr. Nachr.</i> , X. 274.
Durham.	N. Lat. 54° 46' 6".4.	
	Long. W. from Greenwich, 0 ^h 6 ^m 18".0.	<i>Astr. Nachr.</i> , XXVI. 215.
Edinburgh.	N. Lat. 55° 57' 23".2.	
	Long. W. from Greenwich, 0 ^h 12 ^m 43".0.	<i>Edinb. Observ.</i> , X. v.
Florence.	N. Lat. 43° 46' 40".8.	ZACH, <i>Corresp. Astron.</i> , I. 15.
	Long. E. from Paris, 0 ^h 35 ^m 40".2.	<i>Ibid.</i> , p. 14.
Geneva.	N. Lat. by observations of pole-star, 46° 11' 58".72 ± 0.1	
	" " nadir-point, 58.97 ± 0.1	
	Mean,	46 11 58.84 PLANTAMOUR, <i>Mém.</i>
		[<i>de la Soc. de Physique et d'Hist. Nat. de Genève</i> , XI. 15.
	Long. E. from Paris, 0 ^h 15 ^m 16".22.	<i>Astr. Nachr.</i> , XX. 7.
Georgetown.	N. Lat. 38° 54' 26".1.	<i>Astron. Journ.</i> , I. 69.
	Long. W. from Washington, 0 ^h 0 ^m 6".20.	<i>Astron. Journ.</i> , I. 70.
Gotha.	(Seeberg.)	
	N. Lat. 50° 56' 5".19.	GAUSS, <i>Best. d. Breit.-Untersch.</i> , p. 80.
	For the Longitude E. from Paris,	
	WURM found by 11 occultations (<i>Astr. Nachr.</i> ,	
	II. 405),	0 33 34.8 ± 0.13
	PETERS found (<i>Astr. Nachr.</i> , V. 68),	
	Seeberg East from Altona,	3 10.2 2
	" " Göttingen,	3 8.9 15
	West " Königsberg,	39 5.6 18
	East " Paris,	33 34.3 24
	West " Vienna,	22 38.0 17
	Whence, using the present data, we find,	
	Seeberg E. from Paris,	0 33 33.66
	Mean,	0 33 34.2
	For the Observatory attached to Professor HANSEN's house,	
	Long. E. from Paris, 0 ^h 33 ^m 30".046.	SCHUMACHER, <i>Astr. Nachr.</i> ,
	XXIII. 263.	
Göttingen.	GAUSS found, <i>Best. d. Breit.-Untersch.</i> , p. 71, for the N. Latitude of the meridian-circle, 51° 31' 47".85, with the weight 60.9.	
	The Longitude of the same, GAUSS found (<i>Ibid.</i>) by his trigonometrical survey to be West of the meridian-circle in Altona by 7.211 Paris toises. Using BESSEL's data we find 1" = 148.33 toises, whence we have.	

Göttingen West of Altona, $0^h 0^m 0.049$

Altona East of Greenwich, $0 39 46.151$

Göttingen East of Greenwich, $0 39 46.102$

For the old Observatory,

Lat. = $+51^\circ 31' 55''.6$. *Monatl. Corr.*, XXVII. 483.

Long. E. of Paris, $0^h 30^m 25''.2$. *Astr. Nachr.*, II. 407, 408.

Greenwich. . . . N. Lat. $51^\circ 28' 38''.2$. AIRY, *Mem. Astr. Soc.*, XVII. 49.
Long. W. from Paris, $0^h 9^m 21''.46 \pm 15$. HENDERSON, *Phil. Trans.*,
1827, p. 286. See also Washington.

Hamburg. . . . N. Lat. $53^\circ 33' 7''$, by geodetical connection with Altona. *Preface to*
RÜMKER'S Catalogue.

The Longitude given in the table is derived thus:—

Hamburg E. from Altona (HANSEN, *Astr. Nachr.*,
VIII. 277), $0^h 0^m 7.41$

Altona E. from Greenwich (STRUVE, *Exp. Chron.*
de 1844), $0 39 46.15$

Whence Hamburg E. from Greenwich, $0 39 53.56$

Hudson. . . . N. Lat. $41^\circ 14' 42''.6$. LOOMIS, *Trans. Am. Phil. Soc.*, N. S., X. 61.
Long. W. from Philadelphia (U. S. Coast-Survey),

By 3 sets Eastern clock-signals, $0 25^m 5.72$

" 2 " Western " 5.68

$0 25 5.70$

Philadelphia E. from Washington, $7 33.64$

Hudson W. from Washington, $0 17 32.06$

Professor LOOMIS deduced from moon-culminations,

Hudson W. from Greenwich, $5^h 25^m 41''.3$. *Astr. Journ.*, I. 67.

Kasan. . . . N. Lat. $55^\circ 47' 23''.1$. *Astr. Nachr.*, XXVIII. 47.
Long. E. from Berlin, $2^h 22^m 57''.0$. *Berl. Astr. Jahrb.*, 1854, p. 293.

Königsberg. . . N. Lat. $54^\circ 42' 50''.4$. BESSEL, *Astr. Nachr.*, I. 248.
Long. E. from Paris, $1^h 12^m 38.8$ WURM, *Astr. Nachr.*, III. 437.
 88.93 BESSEL, " III. 46.
Mean, $1 12 38.9$

Kremmünster. . N. Lat. $48^\circ 3' 29''.81 \pm 0''.03$. *Astr. Nachr.*, XXXVII. 271.
Long. E. from Paris, $0^h 47^m 11''.96$. SCHUMACHER, *Astr. Nachr.*,
XXIII. 263.

Leipsic. . . . (Pleissenburg.)
N. Lat. D'ARREST, *Astr. Nachr.*, XXVIII.
148, $51^\circ 20' 20''.7 \pm 0.36$ Weight
D'ARREST, *Astr. Nachr.*, XXVIII. 160, 20.4 26.37
Long. E. from Greenwich, $0^h 49^m 28''.5$.

Leyden. N. Lat. $52^{\circ} 9' 28''.16 \pm 0''.15$ } KAISER, *Astr. Nachr.*,
 Long. E. from Paris, $0^h 8^m 35''.97 \pm 0''.19$ } XVII. 100.

Liverpool. N. Lat. $53^{\circ} 24' 47''.40$. *Memoirs R. Astr. Soc.*, XXVI. 7.
 Long. W. from Greenwich, $0^h 12^m 0''.11$. *Naut. Alm.*, 1852, p. 598.

London. (Mr. Bishop's Observatory.)
 N. Lat. $51^{\circ} 31' 29''.8$. *Astr. Obs. at the Observatory South Villa*,
 p. xix.
 Long. W. from Greenwich, $0^h 0^m 37''.1$.

Madras. N. Lat. $13^{\circ} 4' 9''.2$.
 Long. E. from Greenwich, $5^h 20^m 57''$. TAYLOR, *Madras General Catal.*,
 1844, *Pref.* p. ii.

Mannheim. N. Lat. $49^{\circ} 29' 12''.9$. *Astr. Nachr.*, XII. 129.
 Long. E. from Paris, as determined
 By WURM, from occultations (*Astr. Nachr.*, VIII. 458), $0^h 24^m 29.92$
 " connection with Strasburg (*Astr. Nachr.*, XV. 280), 29.87
 " " " Vienna (*Astr. Nachr.*, XV. 279 ;
 XXIII. 263), 30.28
 By connection with Dunkirk (MÜFFLING, *Astr. Nachr.*,
 XV. 279), 30.05
 By OLUFSEN from solar eclipse (*Astr. Nachr.*, XXII.
 234), 30.10
 Mean, $0^h 24^m 30.04$

Markree. N. Lat. $54^{\circ} 10' 31''.72$. *Astr. Journal*, II. 12.
 Long. W. from Greenwich, $0^h 33^m 48''.4$. *Naut. Alm.*, 1852, p. 598.

Marsilles. N. Lat. $43^{\circ} 17' 49''$. *Monatl. Corresp.*, XIII. 139.
 Long. E. from Paris, according to
 LINDENAU (*Monatl. Corr.*, XIX. 421), $\begin{matrix} \text{No. Obs.} \\ 4 \end{matrix}$ $0^h 12^m 7.7$
 WURM (*Monatl. Corr.*, XXVI. 185), 19 7.6
 " (*Astr. Nachr.*, IV. 33), 12 7.5
 INNES (*Astr. Nachr.*, VIII. 435), 4 7.05
 Mean, $0^h 12^m 7.53$

Milan. (Brera.)
 N. Lat. $45^{\circ} 28' 0''.7$. *Corresp. Astron.*, V. 300; *Effem. Astr. di Mi-*
lano, 1846, *App.*, pp. 73-86.
 Long. E. from Paris,
 DAUSSY found from 31 occultations (*Conn. d. Temps*,
 1836, *Add.*, p. 131), $0^h 27^m 24.91$
 LITTROW found Milan W. from Vienna (*Ibid.*), $28^m 45.63$
 $56 \quad 11.07$
 $0^h 27^m 25.44$
 Mean, $0^h 27^m 25.18$

- Modena.** . . . N. Lat. $44^{\circ} 38' 52''.75$. BIANCHI, *Astr. Nachr.*, XVI. 221; *Atti del R. Osserv. di Modena*, I. 336 (1834).
 Long. E. from Milan, $0^h 6^m 55''.99$. *Ibid.*, p. 337.
 Hence E. from Paris,
 By comparison with Milan $0^h 34^m 20''.45$
 WURM from occultations, 23.5 *Astr. Nachr.*, I. 504.
 " " " 24.5 " III. 222.
 STECZKOWSKI from occultations, 21.81 " XVI. 299, 302.
 OLUFSEN from solar eclipse, 22.32 " XXII. 234.
 Mean, $0^h 34^m 22''.51$
- Moscow.** . . . N. Lat. $55^{\circ} 45' 19''.83 \pm 0.08$. SCHWEIZER, *Astr. Nachr.*, XXXVIII. 100.
 Long. E. from Greenwich, $2^h 30^m 16''.93$. *Astr. Nachr.*, XXXVIII. 103.
- Munich.** . . . (Bogenhausen)
 N. Lat. $48^{\circ} 8' 45''$. SOLDNER, *Astr. Nachr.*, IX. 422.
 Long. E. from Paris, $0^h 37^m 4''.98$. *Astr. Nachr.*, VIII. 148.
- Naples.** . . . N. Lat. $40^{\circ} 51' 46''.63$. BRIOSCHI, *Astr. Nachr.*, V. 294.
 The Longitude adopted is that by which PETERS has apparently made his reductions, *Astr. Nachr.*, XXIII. 302, 303, according to which we have,
 Naples E. from Berlin, $0^h 3^m 26''.0$.
 For determinations from solar eclipses by BRIOSCHI and SANTINI, see *Astr. Nachr.*, VI. 413.
- Olmütz.** . . . N. Lat. $49^{\circ} 35' 40''$.
 Long. E. from Greenwich, $1^h 9^m 0''.1$. } *Astr. Nachr.*, XXXVII. 77.
- Oxford.** . . . N. Lat. $51^{\circ} 45' 36''.0$.
 Long. W. from Greenwich, $0^h 5^m 2''.6$. } *Naut. Alm.*, 1852, p. 599.
- Padua.** . . . N. Lat. $45^{\circ} 24' 2''.5$. SANTINI, *Astr. Nachr.*, VI. 411; XVII. 346.
 Long. E. from Paris,
 WURM (*Astr. Nachr.*, IV. 347), $0^h 38^m 7''.7$
 Padua E. from Milan by powder signals
 (FALLON, *Astr. Nachr.*, IV. 115), $0^h 10^m 43''.27$
 Milan E. from Paris, $27^m 24''.18$
 Mean, Padua E. from Paris, $0^h 38^m 7''.57$
- Palermo.** . . . N. Lat. $38^{\circ} 6' 44''$. CACCIATORE, *Del Real Osservatorio di Palermo Libri*, VII, VIII, IX., p. 2; *Storia Celeste del R. Osserv. di Palermo*, in *Ann. d. Wiener Sternwarte*, XXIV. 6.
 Long. E. from Paris, $0^h 44^m 4''.0$. DAUSSY, *Add. Conn. d. Temps*, 1835, p. 8.
 BIANCHI, *Astr. Nachr.*, XVII. 350, calls the latitude of the Palermo Observatory, $+38^{\circ} 6' 25''.50$.

- Paramatta.** . . . S. Lat. $33^{\circ} 48' 49''.79$. RÜMKER, *Phil. Trans.*, 1829, Part III. p. 16.
Long. E. from Greenwich, $10^{\text{h}} 4^{\text{m}} 6'.25$. *Ibid.*, p. 29.
- Paris.** N. Lat. $48^{\circ} 50' 13''.2$. *Conn. d. Temps*, 1835, p. 356.
Long. as above under Greenwich.
- St. Petersburg.** . . (Academy.)
N. Lat. $59^{\circ} 56' 29''.67$.
Long. W. from Pulkowa, $0^{\text{m}} 5'.194$. STRUVE, *Description de l'Obs. de Poulkova*, p. 292.
- Philadelphia.** . . N. Lat. $39^{\circ} 57' 7''.5$. MS. communication from Professor KENDALL.
Long. E. from Washington (U. S. Coast Survey),
By 5 sets Eastern clock-signals, $7^{\text{m}} 33.66$
" " Western " 33.60
Mean, $7 33.63$
Long. Jersey City Station E. from Washington,
By 2 sets Eastern clock-signals, $12^{\text{m}} 3.58$
" " Western " 3.52
Mean, $12 3.56$
Long. W. from Jersey City Station,
By 8 sets Eastern clock-signals, $4 29.91$
" " " " 29.84
Mean, $4 29.88$
Hence we may use,
Jersey City Station E. from Philadelphia, $0^{\text{h}} 4^{\text{m}} 29.89$
" " " Washington, $0 12 3.53$
Philadelphia " " $0 7 33.64$
- Prague.** N. Lat. $50^{\circ} 5' 18''.5$. DAVID, *Astr. Nachr.*, VIII. 198.
Long. E. from Paris,
Mean of 6 occultations (*Astr. Nachr.*, XVI. 299,
302), $0^{\text{h}} 48^{\text{m}} 21.66 \pm 4.15$
HANSEN from occultations (*Astr. Nachr.*, XVII.
170), 19.59 ± 3.67
Mean, Prague E. from Paris, $0 48 20.50$
- Pulkowa.** N. Lat. $59^{\circ} 46' 18''.70$. STRUVE, *Descr. de l'Obs. de Poulkova*, p. 290.
Long. E. from Altona (*Exp. Chron. de* 1843,
p. 144), $1^{\text{h}} 21^{\text{m}} 32.523 \pm 0.039$
Altona E. from Greenwich (*Exp. Chron. de*
1844, p. 206), $0 39 46.151 \pm 0.042$
Pulkowa E. from Greenwich (*Exp. Chron. de*
1844, p. ix.), $2 1 18.674 \pm 0.057$
- Rome.** (Collegio Romano.)
N. Lat. $41^{\circ} 53' 54''$. *Conn. d. Temps*, 1840, p. 354.
Long. E. from Greenwich, $0^{\text{h}} 49^{\text{m}} 54'.7$. *Astr. Nachr.*, VIII. 88.

- San Fernando. . . N. Lat. $36^{\circ} 27' 45''$. *Corresp. Astron.*, XIV. 240.
 Long. W. from Paris, $0^h 34^m 10.6 \pm 0.31$. *Astr. Nachr.*, IX. 358.
- Santiago. . . . (National Observatory.)
 S. Lat. $33^{\circ} 26' 24''.8$. GILLISS, *Astron. Journal*, III. 55.
 Long. W. from Greenwich, $4^h 42^m 18.9$. GILLISS, *Astron. Journal*,
 II. 118.
- Senftenberg. . . N. Lat. $50^{\circ} 5' 10''.1$.
 Long. E. from Berlin, $0^h 12^m 15^s$. } *Astr. Nachr.*, XXXI. 174, 331.
- Upsala. N. Lat. $59^{\circ} 51' 31''.5$. SCHULTZ, *Nova Acta Reg. Soc. Sc. Upsala*, II. 206.
 Long. W. from Stockholm, $0^h 1^m 43.64$ *Ibid.*, II. 218.
 Stockholm E. from Greenwich, 1 12 14.8
 Upsala E. from Greenwich, 1 10 31.2
- Vienna. N. Lat. $48^{\circ} 12' 35''.5$. *Berl. Astr. Jahrb.*, 1852, p. 290.
 Long. E. from Paris, $0^h 56^m 11.07$. SCHUMACHER, *Astr. Nachr.*,
 XXIII. 263.
- Washington. . . N. Lat. $38^{\circ} 53' 39''.25$. *Astron. Journ.*, III. 12.
 Long. W. from Greenwich, as derived from data of the U. S. Coast Survey,
 up to 1852, $5^h 8^m 11.2$.
 The situation of the first, or provisional, Naval Observatory, in which
 were made the observations published by Lieutenant GILLISS, was,
 N. Lat. $38^{\circ} 53' 32''.8$. GILLISS, *Astr. Obs.*, p. viii.
 Long. W. from Greenwich, $5^h 8^m 4.6$. *Ibid.*, p. x.
- Wilna. N. Lat. $54^{\circ} 40' 59''.1$. *Astr. Nachr.*, IV. 562.
 Long. E. from Paris,
 WURM from 22 occultations (*Astr. Nachr.*, VIII. 96), $1^h 31^m 50.4$
 STECZKOWSKI from 1 occultation (*Astr. Nachr.*, XVI. 302), 48.3
 Mean, $1^h 31^m 50.31$

These results are arranged in the following Table for reference.

POSITIONS OF THE PRINCIPAL OBSERVATORIES.

(North Latitudes and West Longitudes are considered as positive.)

Place.	Latitude.	Longitude from Washington in Time.			Longitude from Washington in Arc.			Longitude from Greenwich in Arc.		
		h	m	s	°	'	"	°	'	"
Åbo,	+60° 26' 56.8	— 6	37	20.0	260° 40' 0.6	337	42	48.6		
Albany,	+42 39 50.0	— 0	13	12.6	356 41 51.0	73	44	39.0		
Altona,	+53 32 45.3	— 5 47 57.4	273	0 39.8	350	3	27.8			
Ann Arbor,	+42 16 48.0	+ 0 26 41.0	6	40 15.0	83	43	3.0			
Athens,	+37 58 20.0	— 6 43 6.4	259	13 24.2	336	16	12.2			
Berlin,	+52 30 16.7	— 6 1 46.1	269	33 28.1	346	36	16.1			
Bilk,	+51 12 25.0	— 5 35 16.1	276	10 58.1	353	13	46.1			
Bonn,	+50 43 45.0	— 5 36 35.7	275	51 5.1	352	53	53.1			
Breslau,	+51 6 56.0	— 6 16 21.2	265	54 42.0	342	57	30.0			
Brussels,	+50 51 10.7	— 5 25 38.8	278	35 18.0	355	38	6.0			
Cambridge (Eng.), .	+52 12 51.8	— 5 8 34.7	282	51 18.9	359	54	6.9			
Cambridge (Mass.),	+42 22 48.6	— 0 23 41.5	354	4 36.9	71	7	24.9			
Cape of Good Hope,	—33 56 3.0	— 6 22 7.2	264	28 12.3	341	31	0.3			
Christiania,	+59 54 43.7	— 5 51 6.0	272	13 30.6	349	16	18.6			
Cincinnati,	+39 5 54.0	+ 0 29 46.9	7	26 42.8	84	29	30.8			
Copenhagen,	+55 40 53.0	— 5 58 30.5	270	22 22.5	347	25	10.5			
Cracow,	+50 3 50.0	— 6 28 2.4	262	59 23.4	340	2	11.4			
Dorpat,	+58 22 47.1	— 6 55 5.8	256	13 33.6	333	16	21.6			
Dublin,	+53 23 13.0	— 4 42 49.2	289	17 42.0	6	20	30.0			
Durham,	+54 46 6.4	— 5 1 53.2	284	31 42.0	1	34	30.0			
Edinburgh,	+55 57 23.2	— 4 55 28.2	286	7 57.0	3	10	45.0			
Florence,	+43 46 40.8	— 5 53 12.9	271	41 47.1	348	44	35.1			
Geneva,	+46 11 58.8	— 5 32 48.9	276	47 46.8	353	50	34.8			
Georgetown,	+38 54 26.1	+ 0 0 6.2	0	1 33.0	77	4	21.0			
Göttingen,	+51 31 47.9	— 5 47 57.3	273	0 40.5	350	3	28.5			
Gotha,	+50 56 5.2	— 5 51 6.9	272	13 17.1	349	16	5.1			
Greenwich,	+51 28 38.2	— 5 8 11.2	282	57 12.0	0	0	0.0			
Hamburg,	+53 33 7.0	— 5 48 4.8	272	58 48.6	350	1	36.6			
Hudson,	+41 14 42.6	+ 0 17 32.1	4	23 0.9	81	25	48.9			
Kasan,	+55 47 23.1	— 8 24 43.1	233	49 13.1	310	52	1.1			
Königsberg,	+54 42 50.4	— 6 30 11.6	262	27 6.6	339	29	54.6			
Kremsmünster, . . .	+48 3 23.8	— 6 4 44.6	268	48 50.7	345	51	38.7			
Leipsic,	+51 20 20.7	— 5 57 39.7	270	35 4.5	347	37	52.5			
Leyden,	+52 9 28.2	— 5 26 8.6	278	27 50.6	355	30	38.6			
Liverpool,	+53 24 47.4	— 4 56 11.1	285	57 13.7	3	0	1.7			
London,	+51 31 29.8	— 5 7 34.1	283	6 28.5	0	9	16.5			
Madras,	+13 4 9.2	—10 29 8.2	202	42 57.0	279	45	45.0			
Mannheim,	+49 29 12.9	— 5 42 2.7	274	29 19.5	351	32	7.5			
Markree,	+54 10 31.7	— 4 34 22.8	291	24 18.0	8	27	6.0			
Marseilles,	+43 17 49.0	— 5 29 40.2	277	34 57.2	354	37	45.2			
Milan,	+45 28 0.7	— 5 44 57.8	273	45 32.4	350	48	20.4			
Modena,	+44 38 52.8	— 5 51 55.2	272	1 12.5	349	4	0.5			
Moscow,	+55 45 19.8	— 7 38 28.1	245	22 58.5	322	25	46.5			
Munich,	+48 8 45.0	— 5 54 37.6	271	20 35.4	348	23	23.4			
Naples,	+40 51 46.6	— 6 5 12.1	268	41 58.1	345	44	46.1			
Olmütz,	+49 35 40.0	— 6 17 11.3	265	42 10.5	342	44	58.5			
Oxford,	+51 45 36.0	— 5 3 8.6	284	12 51.0	1	15	39.0			
Padua,	+45 24 2.5	— 5 55 40.2	271	4 56.6	348	7	44.6			
Palermo,	+38 6 44.0	— 6 1 36.7	269	35 50.1	346	38	38.1			
Paramatta,	—33 48 49.8	+ 8 47 42.6	131	55 38.3	208	58	26.3			
Paris,	+48 50 13.2	— 5 17 32.7	280	36 50.1	357	39	38.1			

Place.	Latitude.	Longitude from Washington in Time.	Longitude from Washington in Arc.	Longitude from Greenwich in Arc.
St. Petersburg, . . .	+59° 56' 29.7"	^h —7 ^m 9 ^s 24.7	252° 38' 49.8"	329° 41' 37.8"
Philadelphia, . . .	+39 57 7.5	—0 7 33.6	358 6 35.4	75 9 23.4
Prague,	+50 5 18.5	—6 5 53.2	268 31 42.6	345 34 30.6
Pulkowa,	+59 46 18.7	—7 9 29.9	252 37 31.9	329 40 19.9
Rome,	+41 53 54.0	—5 58 5.9	270 28 31.5	347 31 19.5
San Fernando, . . .	+36 27 45.0	—4 43 22.1	289 9 29.1	6 12 17.1
Santiago,	—33 26 24.8	—0 25 52.3	353 31 55.5	70 34 43.5
Senftenberg, . . .	+50 5 10.1	—6 14 1.1	266 29 43.1	343 32 31.1
Upsala,	+59 51 31.5	—6 18 42.4	265 19 24.0	342 22 12.0
Vienna,	+48 12 35.5	—6 13 43.7	266 34 4.1	343 36 52.1
Washington,	+38 53 39.3	0 0 0.0	0 0 0.0	77 2 48.0
Wilna,	+54 40 59.1	—6 49 23.0	257 39 15.5	334 42 3.5

ON THE ARRANGEMENT AND USE OF THE TABLES IN THIS EPHEMERIS.

THIS Ephemeris is divided into two distinct parts. One part is designed for the special use of NAVIGATORS, and is adapted to the Meridian of Greenwich.

The other part is suited to the convenience of ASTRONOMERS, on this continent particularly, and is adapted to the Meridian of Washington.

THE NAUTICAL PART.

This part contains the Ephemeris of the Sun and Moon; the Distances of the Moon from the centres of the Sun and the four most conspicuous Planets, and from certain Fixed Stars; the Ephemeris of the Planets Venus, Mars, Jupiter, and Saturn; the Mean Places of 100 principal Fixed Stars, for January 1, 1863.

Time. — Astronomers make use of several different kinds of time; an explanation of the nature of which, and of the method of passing from one to another, properly precedes an explanation of the uses of the Ephemeris.

Sidereal Time. — Sidereal Time is measured by the daily motion of the stars, or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over any meridian, and its next succeeding return to the same meridian. *It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian.

Solar Time. — Solar Time is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour angle of the sun is called *Solar Time*. This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the meridian are not exactly equal, but depend upon the variable motion of the sun in right ascension.

The want of uniformity in the sun's motion in right ascension arises from two different causes; one, that the sun does not move in the equator, but in the ecliptic; the other, that the sun's motion in the ecliptic is not uniform.

To avoid the irregularity in time caused by the want of uniformity in the sun's motion, a fictitious sun, called a *Mean Sun*, is supposed to move in the equator with a uniform velocity.

Mean Time, which is perfectly equable in its increase, is measured by the motion of this *Mean Sun*; the latter at certain periods agrees with the real sun, then again is in advance of it, and at other times is behind it.

True or Apparent Time is measured by the motion of the real sun.

The difference between the *true* and *mean* time is called the *Equation of Time*. By means of it we pass from *true* to *mean* time, or the reverse. Thus, if the *true* time be given, the *mean* time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I. of the Calendar. If the *mean* time be given, the *true* time is obtained by applying the equation of time as directed by the precept on page II. of the Calendar.

The vernal equinox, by the motion of which Sidereal Time is measured, is not a fixed, but a movable, point on the equator. Its motion is composed of two parts: precession, which is proportional to the time, and is combined with the daily motion of the heavens; and nutation, which is periodical. In consequence of the latter, the daily motion of the equinox is not strictly a uniform measure of time, and the Sidereal Time in common use might therefore be called *Apparent Sidereal Time*, and *Mean Sidereal Time* would be that reckoned from the transit of the mean equinox; but the irregularity referred to cannot exceed $2'.3$ in a period of nineteen years, and is, therefore, of no practical importance.

Day.—According to the customs of society, the hours are counted from 0 to 12 from noon to midnight, after which they are again reckoned from 0 to 12 from midnight to noon. The *civil day* consists of twenty-four hours, but is divided in this manner into two periods, commencing at midnight. In this respect it differs from the *astronomical day*, which commences at noon. The *civil day* comprises twenty-four hours, from one midnight to the next following. The first period of twelve hours is marked A. M., the last period of twelve hours is marked P. M. The *astronomical day* also comprises twenty-four hours, but they are counted from 0 to 24, and from the noon of one day to that of the next following.

The civil day begins twelve hours before the astronomical day; therefore the first part of the *civil day* answers to the last part of the preceding *astronomical day*, and the last part of the *civil day* to the first part of the same *astronomical day*. Thus, January 10th, 2^{*h*} A. M., *civil day*, is January 9th, 14^{*h*}, *astronomical day*; and January 9th, 2^{*h*} P. M., *civil day*, is also January 9th, 2^{*h*}, *astronomical day*. The rule, then, for the transformation of the civil time into astronomical time is this: If the civil time is marked A. M., take one from the date, and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.

The Calendar is divided into twelve months, and to each month are assigned eighteen pages, of which the contents are as follows:—

Pages I., II., III. are devoted to the Ephemeris of the Sun. Page I. contains, first, the *Apparent Right Ascension and Declination* of the sun at Greenwich apparent noon.

The former of these quantities is used for finding the error of a clock regulated to sidereal time. The difference between the time by the clock of the meridian passage of the sun, and the sun's right ascension reduced to apparent noon, is the error of the clock from sidereal time. It is also employed in determining the time by the transit of a fixed star over the meridian, as is explained in page 223 of BOWDITCH'S *American Practical Navigator*. The use of the sun's declination in finding the true amplitude and azimuth, the latitude by altitudes of the sun in and out of the meridian, the time, &c., is also so clearly defined in this standard work, which is in the hands of all American seamen, that any further explanation in this place is unnecessary. Adjoining the columns of *Right Ascension* and *Declination* are the differences of these quantities for one hour (at noon), by means of which they may be calculated for any time out of the meridian, by multiplying this difference by the hours and parts of hours from noon, and adding the amount to, or subtracting it from, the quantity at noon, according as it is increasing or decreasing. If, for example, the declination of the sun were required at 3^{*h*} 40^{*m*} P. M. of Saturday, January 17th, 1863, the declination of the sun would be taken out first for

January 17th, at noon.

From which subtract the diff. for 1 hour, 29".48, multiplied by 3,

And the proportional part for 40 minutes,

The result is the sun's declination on the 17th, at 3^{*h*} 40^{*m*} P. M.,

20° 46' 54.1 S.

1 28.4

20 45 25.7

19.7

20 45 6.0

The difference for one hour is not the same for every hour in the twenty-four; but being given in the pages of this Ephemeris for the first hour of the day, it is sufficiently accurate for the purposes of the navigator.

The column of the *Sun's Semidiameter* requires no explanation.

The column headed *Sidereal Time of the Semidiameter passing the Meridian*, is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. If the western limb has been observed, the quantity found in this column is to be added to the time of transit over the middle wire, or the mean of the times of transit over all the wires; but if the eastern limb has been observed, the quantities in this column are to be subtracted.

The next column contains the *Equation of Time*, which, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the *apparent time*, or the time given by an observation of the sun, to obtain the *mean time*, or the time shown by a clock. The heading of the column directs the manner in which the equation is to be applied, and where there is a change in the course of the month from addition to subtraction, or the reverse, as in the months of April and June, the two different directions are separated by a line, while a corresponding line below points out the date at which the change takes place. The difference for one hour is given in an adjoining column, by means of which the equation for any time from noon is easily obtained. If, for example, the equation of time for January 16th, at 3^h. 20^m. P. M., were required, we should have

Equation for January 16, at noon,	m.	s.
Correction for 3 ^h . 20 ^m . (additive),	9	58.89
		2.87
Equation, January 16, at 3 ^h . 20 ^m . P. M.,	10	1.76

Which, according to the rule at the head of the column, is to be added to *apparent time* to obtain *mean time*.

Page II. contains the Apparent Right Ascension and Declination of the Sun, and the Equation of Time for Greenwich *Mean Noon*; to these is added a column containing the Sidereal Time of Mean Noon.

Page III. contains the Longitude and Latitude of the Sun, and the Logarithm of the Distance of the Earth, at Greenwich Mean Noon of each day. The Longitude is given in two columns, headed λ and λ' ; and one, λ , is the Sun's longitude counted from the true equinox of the date; the other, λ' , is the same coördinate counted from the mean equinox of the beginning of the year. A column of hourly differences enables the computer to obtain the Sun's longitude for any hour from noon. The hourly differences of the logarithm of the Radius Vector are likewise given. The longitudes of the Sun are the true longitudes, not affected by aberration. The last column on this page contains the Mean Time of Sidereal Noon.

Page IV. contains the Moon's *Semidiameter* and *Horizontal Parallax* for every noon and midnight. The former may be corrected for any time between the dates for which it is given in the Ephemeris, by means of Table XI. of BOWDITCH'S *Navigator*, or simply by computing the proportional part.

This is readily done by considering that the semidiameter is given for every twelve hours, that the difference, therefore, between any two successive semidiameters corresponds to twelve hours, and that the difference required (or correction) is that difference which corresponds to a time less than twelve hours. If, for example, the semidiameter of the moon is to be taken out for 9 o'clock, P. M. of the 14th of January, then we say, that as twelve hours is to 6".6, the whole difference between the semidiameters at noon and midnight of the 14th, so is nine hours to 5".0, the correction to be added to the semidiameter at noon, because it is increasing; the moon's semidiameter, then, for Jan. 14^d. 9^h. is 16' 11".1. Adjoining the columns containing the Moon's

Horizontal Parallax for noon and midnight, are columns giving the change which these quantities undergo in one hour. The sign plus or minus (+ or —) is prefixed to these differences, showing whether they are additive or subtractive, or, in other words, whether the horizontal parallax is increasing or decreasing. In order to reduce the parallax to any time intermediate between those dates for which it is given in the Ephemeris, the mode of proceeding is that which has been already explained in the case of the equation of time. The Moon's *Meridian Passage*, which is given on this page to minutes and tenths of minutes, is also accompanied with a column of differences for one hour, by means of which, having the longitude turned into time, the time of the moon's meridian passage at any other place may be computed. Or it may be more quickly derived from BOWDITCH'S Table XVIII., by simple inspection. The last column of this page contains the *Age* of the Moon, to tenths of days, or the time elapsed since the preceding new moon. It requires no explanation.

The pages from V. to XII. inclusive are taken up with the Moon's *Right Ascension and Declination*, which are given for every hour of every day in the month, and are accompanied with columns of differences for every minute of each hour. The right ascension and declination of the moon change so rapidly, that, if they were not given at frequent intervals, the moon would cease to be useful to the practical navigator as a means of determining the latitude and time. These quantities are wanted for Greenwich mean time, which is either taken directly from the face of a well-regulated chronometer, or is obtained by applying the longitude, turned into time, to the local time of the computer. They have only to be corrected for the minutes and seconds of the time at Greenwich. Thus, if the right ascension and declination of the moon were required for Saturday, January 3^d. 8^h. 10^m., we have only to add to the right ascension at 8^h. as given in the Ephemeris, viz. to 5^h. 54^m. 54^s.11, the product of the difference for one minute in the adjoining column multiplied by 10, the product, that is, of 2^s.1261 by 10, or 21^s.26; the result is the moon's right ascension at the required time, equal to 5^h. 55^m. 15^s.37. If we were to take out the declination for the same date, the correction for the ten minutes above the hour would be subtractive, because the declination, unlike the right ascension, is decreasing; thus,

Moon's declination for January 3 ^d . 8 ^h .	22° 17' 23.0 N.
Correction for 10 ^m is	23.8
Moon's declination for January 3 ^d . 8 ^h . 10 ^m .	22 16 59.2

The last page of the right ascensions and declinations contains the *Phases* of the Moon, and the dates of the Moon's *Perigee* and *Apogee*, or least and greatest distances from the earth.

The remaining six pages of the month are occupied by the *Lunar Distances*. They are given in the same manner as in the British *Nautical Almanac*, in order to conform to the rules of BOWDITCH'S *Navigator*. These tables contain the geocentric distances of the centre of the moon from the sun, the larger planets, and certain fixed stars, at intervals of three hours, beginning with the noon of each day. All the distances that can be observed on the same day are grouped together under that date, and the letter E. or W. is affixed to the name of the star or planet, to indicate whether it is on the east or west side of the moon. The columns are read from the left to the right, across both pages of the same opening. The principle of determining the longitude by means of lunar distances consists in this: that they furnish the navigator with the means of comparing his own time, on board ship, with the time at the Greenwich Observatory. At the moment of observing a distance he notes the time by his own watch or chronometer, and by looking into the Ephemeris he discovers what o'clock it is at Greenwich when the moon and star are in the relative position with regard to each other which he has measured with his sextant. But it will very rarely occur that the navigator's *true distance*, that is, his observed distance cleared from the effects of refraction and

lunar parallax, will be found in the Ephemeris. It will prove in most cases to be a quantity lying between two given distances. He is obliged, therefore, to take the difference between his own true distance and the one nearest to it in the pages of the Ephemeris, and to apply to the time standing over the latter a correction proportioned to this difference. This is a case of the simple rule of three. Owing, however, to the various denominations of space and time that enter into the question, it has been found convenient to lessen the labor of the operation by putting between every two successive distances given in the Ephemeris the proportional logarithm of their difference. This proportional logarithm is obtained by subtracting the logarithm of the difference of the two distances from the logarithm of three hours (both quantities being reduced to seconds), because three hours is the interval of time between two successive distances.

On the 4th of May, at midnight, of Greenwich mean time, the distance of the moon's centre from the planet Saturn, west of her, is $63^{\circ} 16' 45''$, and at fifteen hours of the same date it is $65^{\circ} 5' 33''$; the difference between the two distances is $1^{\circ} 48' 48''$, or, reduced to seconds, is 6528'', the logarithm of which, subtracted from the logarithm of three hours, or 10800'', gives for the proportional logarithm of the difference between the two distances 2186, as it is in the column headed *P. L. of Diff.* If the calculated *true distance* of the navigator lie between the two given distances above mentioned, as, for instance, if it should be $64^{\circ} 4' 31''$, the corresponding correction of the time would be found as follows:—

Distance in the Ephemeris at Midnight,	$63^{\circ} 16' 45''$
Calculated <i>True Distance</i> ,	$64^{\circ} 4' 31''$
Difference,	$0^{\circ} 47' 46''$
Prop. log. in Ephemeris,	2186
Prop. log. of Difference, $0^{\circ} 47' 46''$,	5761
Prop. log. of $1^{\text{h}} 19^{\text{m}} 2^{\text{s}}$.	3575

And this time is to be added to the time at the head of the column from which the distance of the Ephemeris was taken, which would make the time at Greenwich corresponding to the Navigator's True Distance $1^{\text{h}} 19^{\text{m}} 2^{\text{s}}$ on the morning of the 5th of May.

This method of getting the Greenwich time between two given times in the Ephemeris rests upon the supposition, that the variation between one distance and the next following is uniform and regular. But owing to the inequalities in the moon's motion, this is not the case; and it is, in consequence of this, necessary to apply to the Greenwich time obtained by the preceding method a small correction.

This correction, due to the second differences in the moon's motion, is given in the Table on page 252 and is taken out and applied as follows.

The top of the Table is entered with the difference between that proportional logarithm of the Ephemeris which has already been used and the one next following, and the side of the Table is entered with the time which has been added to that at the head of the column of the Ephemeris, that is, the time given by the difference of the proportional logarithms at the close of the preceding paragraph; under the former, and opposite the latter, will be found the correction, in seconds of time, to be added to the time at Greenwich if the proportional logarithms are decreasing, but subtracted if they are increasing.

The Ephemeris of the Planets, from page 218 to page 241, consists of the apparent right ascension at Greenwich mean noon and its variation for one hour, the apparent declination at the same date and its variation for one hour, and the mean time of their meridian passage; and at the bottom of the page will be found the semidiameter and horizontal parallax for every fifth day of the month. The hourly variations belong to noon of the day on which they are given. The mode of correcting by means of the hourly variation for any time from noon has already been explained.

The Solar Coördinates for Greenwich mean noon, on pages 242–244, are added, and the Moon's Longitude and Latitude on pages 245–248.

Finally, the Mean Places of the one hundred principal Fixed Stars for January 1, 1863, are given on pages 249–251.

When the latitude is to be deduced from the meridian altitude of one of these stars, its time of passing the meridian can be ascertained by taking the sum of the right ascension of the star, and the mean time of sidereal noon contained in the last column of page III. of each month. The right ascension of the star is, in fact, its hour angle, or difference in time, from the sidereal noon, or 0^h. If then a vessel in longitude 45° West should wish to obtain the latitude by a meridian observation of a star, as, for example, α TAURI (*Aldebaran*), on the evening of January 1, 1863, the process for obtaining the time of meridian passage would be as follows:—

Mean Time of sidereal 0 ^h January 1, 1863,	^{h.} ^{m.} ^{s.} 5 16 34
Correction for Longitude omitted.	
Right Ascension of α TAURI (<i>Aldebaran</i>),	4 28 4
Time of star's meridian passage,	9 44 38

The instant of passage might be more accurately determined by making an allowance for the difference between mean solar and sidereal time, and by applying the correction for longitude; but the above is sufficiently near for the purpose for which it is wanted, which is, to know the period of meridian passage approximately, in order to identify the star if necessary, and to be in time with the observation. The navigator will perceive that the dates in this column of page III. are astronomical, and will observe the distinctions of time explained in the first part of this article; he will also remember that when the sum exceeds 24 hours, 24 hours are to be subtracted, and a unit is to be added to the day of the month.

The Sun's Right Ascension may also be used for finding the time of meridian passage of a star, as shown in BOWDITCH's *Navigator*, p. 223.

THE ASTRONOMICAL PART.

THIS part is adapted to the meridian of Washington.

Obliquity of the Ecliptic, &c., p. 250.—On this page are given the apparent obliquity, the equation of equinoxes in longitude and right ascension, the precession of equinoxes in longitude, and the sun's aberration and horizontal parallax, for every ten days of the year; at the bottom of the page will be found the mean obliquity for the beginning of the year, the precession for the middle of the year, the logarithm of the precession in a sidereal day, and the logarithm of the precession in a solar day. On the same page, the mean longitude of the moon's ascending node is also given for every ten days, and at the bottom of the page its daily motion.

Fixed Stars.—The Logarithms *A, B, C, D*, for correcting the places of the Fixed Stars, are given for the mean midnight of every day of the year, and the constants of reduction for every five days. To these tables are added BESSEL's formulas of reduction, with PETERS' coefficients, and the notation of the catalogue of stars of the British Association.

The *mean* places of 100 principal Fixed Stars on January 1, 1863; the *apparent* places of α and δ Ursæ Minoris, at the time of the upper transit at Washington, for every day of the year; and the *apparent* places of the remaining principal stars for every ten days; together with a table giving the correction of 51 Cephei, σ Octantis, and λ Ursæ Minoris, for terms of nutation involving 2 ϵ ,—complete the subject of the Fixed Stars.

Solar Ephemeris.—In the Solar Ephemeris, given for Washington mean and apparent noon, the hourly motions in right ascension and declination are the motions at the instant of noon. Only the seconds of right ascension and declination are given for apparent noon, the degrees and minutes being usually the same as for mean noon.

The *Moon Culminations* and *Moon-culminating Stars* are given in two distinct lists. The list of Moon Culminations contains both the solar and sidereal dates of transit; the apparent right ascension is the right ascension of the limb, and the declination is the declination of the centre, at their respective periods of culmination. The form of the lists of moon-culminating stars has been somewhat changed. In the first volume of the Ephemeris, reference to the stars to be used in connection with the Moon was made by a figure, and the stars themselves were entered successively in the order of numbers. In the present volume these figures are dispensed with, and the proper star to be observed in connection with the transit of the moon's limb is determined by means of the sidereal dates, common to both lists. Each star occupies a separate column containing its right ascension to hundredths of seconds for every sidereal date throughout the year for which it is available, and also its declination and magnitude. The first column of each page contains the sidereal date, and the last the daily change in right ascension of the corresponding stars. It is hoped that the standard observatories will determine the place of each one of these stars once at least in the course of the year. The whole list has been taken from the Twelve-Year Catalogue.

The *Ephemeris of the Moon*, which follows, and the *Moon's Phases*, require no special observation. In the moon's ephemeris, as in that of the sun, the hourly motions belong to the instant for which they are given.

The ephemeris of the two interior planets is given for mean noon and the time of transit; and that of the exterior planets is given for sidereal noon and the time of transit. The place of a planet for any number of minutes t , from the nearest noon for which it is given, t being negative when the time precedes the noon, may be computed by the formula,

$$\text{Planet's R. A. (or Dec.)} = A + B t + C t^2,$$

in which $A =$ R. A. (or Dec.) for the noon,
 $B =$ the motion of R. A. (or Dec.) for 1 minute,
 or, more exactly, $=$ the factor of t , as given in the Ephemeris;
 $C =$ the factor of $t^2 =$ factor for second differences.

The *Solar Coördinates* are given for each mean noon and midnight, referred to the apparent equinox and equator, and also to the mean equinox and equator, at the beginning of the year. In the case of the rectangular coördinates, only the last four decimals are given for the mean equinox and equator, and the first three places are to be taken from the apparent equinox and equator. When a change of a unit is to be made in the third place, it is indicated by a corresponding colon (:).

The *Planetary Coördinates* are referred to the mean equinox and ecliptic of the mean noon of the 2400,000th day of the Julian Period, and the dates for which they are given are counted from this epoch in mean solar days. They may be converted into days of the Julian Period by adding 2400,000. The columns $-\frac{k^2}{r^3}x$, &c. contain the quantities $-1600 m \frac{k^2}{r^3}x$, $-1600 m \frac{k^2}{r^3}y$, $-1600 m \frac{k^2}{r^3}z$, in units of the 7th decimal place, in which m denotes the mass of the planet, and k^2 the unit of attractive force in the solar system, or $\log k = 8.2355814$.

Eclipses.—The *Tables of Data of the Solar Eclipses* are adapted to very accurate computation by the following formulas.

$$\begin{aligned}\text{Let } \phi &= \text{the latitude of the place,} \\ \lambda &= \text{its western longitude from Washington,} \\ \log e &= 8.9110835, \\ \log (1 - e^2) &= 9.9971066, \\ \sin \phi' &= e \sin \phi, \\ h &= \sec \phi' \cos \phi, \\ k &= (1 - e^2) \sec \phi' \sin \phi, \\ a &= A - h \sin (\mu - \lambda), \\ b &= B - E k + G h \cos (\mu - \lambda), \\ c &= -C + F k - H h \cos (\mu - \lambda), \\ m &= \sqrt{bc}.\end{aligned}$$

If the instant for computation were correctly chosen at the time of beginning or end of the eclipse, m would be exactly equal to a . If m be not equal to a , the instant for a new computation, which will be an approximation to the actual time of beginning or end, may be found by adding to the preceding time of computation an interval t , which may be obtained in seconds by the formulas,

$$\begin{aligned}\log \mu' &= 1.86167, \\ \tan \frac{1}{2} \psi &= \frac{c}{m} = \frac{m}{b}, \\ a' &= A' - \mu' h \cos (\mu - \lambda), \\ b' &= B' - \mu' G h \sin (\mu - \lambda), \\ t &= \frac{1000000 (m - a)}{a' + b' \cot \frac{1}{2} \psi};\end{aligned}$$

ψ must be taken of the same sign with a , and is a sufficiently near approximation to the angle of contact from the north towards the east. For the shadow of a total eclipse, ψ must be taken with a sign opposite that of a .

The magnitude of the eclipse is found by taking the difference (with regard to the signs) between the value of ψ at the beginning and its value at the end of the eclipse, and if this difference is denoted by 2θ , the number of digits eclipsed is

$$12 (1 + n) \sin^2 \frac{1}{2} \theta, \quad \text{or, } 12 (1 + n) \cos^2 \frac{1}{2} \theta,$$

according as θ is acute or obtuse; n is the ratio of the semidiameter of the moon to that of the sun.

The value of θ may also be obtained by the formulas

$$\tan \chi = \frac{b'}{a'}, \quad \theta = \psi + \chi,$$

(in which χ has the sign of b'); and the expression of t may be changed to

$$t = 1000000 \cdot \frac{m-a}{a'} \cdot \frac{\cos \chi \sin \psi}{\sin \theta}.$$

The following is an example of the computation of the end of the Eclipse of November 10, for the Observatory at Cape of Good Hope.

For Cape of Good Hope, $\phi = -33^\circ 56' 3''.0$	$\lambda = 264^\circ 28' 12''.3$
$\log \sin \phi = 9.7468209 n$	$\log \cos \phi = 9.9189104$
$\log \sin \phi' = 8.6579044 n$	$\log \sec \phi' = 0.0004498$
$\log k = 9.7443773 n$	$\log h = 9.9193602$

A first approximation may be made from the chart, and corrected by a computation like the following. In this way we obtain $14^h 45^m$ Washington mean time as a near approximation to the time of the end of the eclipse at Cape of Good Hope. For a nearer approximation, take from the table (p. 405) for $14^h 45^m$

A = — 0.29687	$\log E = 9.979178$
B = — 0.28645	$\log F = 9.980460$
C = — 1.38600	$\log G = 9.480601 n$
A' = +151.17	$\log H = 9.467447 n$
B' = — 27.78	$\mu = 225^\circ 12' 56''.3$

Hence

$\mu - \lambda = 320^\circ 44' 44''.0$	
$\log \cos (\mu - \lambda) = 9.888934$	$\log \sin (\mu - \lambda) = 9.801243 n$
$\log [h \cos (\mu - \lambda)] = 9.808294$	$\log [h \sin (\mu - \lambda)] = 9.720603 n$
$\log [G h \cos (\mu - \lambda)] = 9.288895 n$	$\log [H h \cos (\mu - \lambda)] = 9.275741 n$
$\log (E k) = 9.723555 n$	$\log (F k) = 9.724837 n$
$G h \cos (\mu - \lambda) = -0.19449$	$-H h \cos (\mu - \lambda) = + 0.18869$
$-E k = +0.52912$	$F k = - 0.53069$
$B = -0.28645$	$-C = + 1.38600$
$b = +0.04818$	$c = + 1.04400$
$\log b = 8.682867$	$-h \sin (\mu - \lambda) = + 0.52554$
$\log c = 0.018700$	$A = - 0.29687$
$\log m = 9.350783$	$a = + 0.22867$
$\log \tan \frac{1}{2} \psi = 0.667917$	$m = + 0.22428$
$\psi = +155^\circ 45'$	$m - a = - 0.00439$
$\log [\mu' h \cos (\mu - \lambda)] = 1.66996$	$\log [G \mu' h \sin (\mu - \lambda)] = 1.06287$
$-\mu' h \cos (\mu - \lambda) = - 46.77$	$-G \mu' h \sin (\mu - \lambda) = -11.56$
$a' = +104.40$	$b' = -39.34$
$a' + b' \cot \psi = +191.73$	$\log b' = 1.59483 n$
$\log [10^6 (m - a)] = 3.6425 n$	$\log \cot \psi = 0.34634 n$
$\log (a' + b' \cot \psi) = 2.2827$	$b' \cot \psi = +87.33$
$\log t = 1.3598 n$	$t = -22.90$

Approximate time	14 45 0.00
t, the correction	—22.90
Washington mean time of end	14 44 37.10
Cape of Good Hope mean time of end	21 6 44.28

Occultations.—The pages 407 to 437 inclusive are taken up with *Elements for Facilitating the Calculation of Occultations of Planets and Stars by the Moon*. These elements are given for all the stars to the fifth, and for some of the sixth magnitude, inclusive, contained in the British Association Catalogue, which can be occulted by the moon during the year 1863.

The several columns of these pages contain, — 1. the date; 2. the star's name; 3. the star's magnitude; 4. the limiting parallels of visibility; 5. Washington mean time of the moon's true conjunction with the star in right ascension; 6. Washington hour angle, in time, of the star at the time of true conjunction; 7. coördinate q at the time of true conjunction, 8. hourly variation p' of coördinate p ; 9. hourly variation q' of coördinate q ; 10. logarithmic sine of the star's declination; 11. logarithmic cosine of the star's declination.

Designating the time of true conjunction by the usual symbol, ζ , we have, at this time, $T = \zeta$, $h = H$, $p = 0$, and $q = Y$. For any other time during the occultation, we shall have $T = \zeta + (t)$, $h = H +$ sidereal equivalent of (t) , $p = (t) p'$, and $q = Y + (t) q'$. The other elements are considered as constant for the occultation.

In the prediction of an occultation for a particular place, the principal objects of determination are, the instant of *immersion*, or of the star's disappearance behind the moon's limb; of *emersion*, or of the star's reappearance; and the points on the moon's border where these appearances take place.

The calculations are made according to the method of BESSEL, whose original paper on the subject may be found in SCHUMACHER'S *Astronomische Nachrichten*, Vol. VII. p. 1; also in the *Berliner Astronomisches Jahrbuch* for 1831, p. 257. The letters and numerals prefixed to the stars belonging to the group of the Pleiades, and the magnitudes of these stars, are taken from No. V. of BESSEL'S *Astronomische Untersuchungen*.

The process of computation is shown by the following equations:—

d = Longitude for Washington, of the place, + West, — East

ϕ = Geographical North Latitude of the place.

ϕ' = Geocentric North Latitude of the place.

r = Earth's radius at the place, or the distance of the observer's position from the earth's centre.

It is unnecessary to calculate ϕ' and r separately, as we have

$$r \sin \phi' = \frac{(1 - e^2) \sin \phi}{\sqrt{(1 - e^2 \sin^2 \phi)}} \quad r \cos \phi' = \frac{\cos \phi}{\sqrt{(1 - e^2 \sin^2 \phi)}}$$

in which e denotes the eccentricity of the earth's meridians.

The logarithms of $\frac{1 - e^2}{\sqrt{(1 - e^2 \sin^2 \phi)}} = \log A$, and of $\frac{1}{\sqrt{(1 - e^2 \sin^2 \phi)}} = \log B$, derived from $e = .081697$, according to the latest determination of BESSEL, may be taken from the following table, where the geographical latitude of the place is the argument.

ϕ	Log. A	Log. B
0	9.9971	0.0000
10	9.9971	0.0000
20	9.9973	0.0002
30	9.9975	0.0004
40	9.9977	0.0006
50	9.9979	0.0009
60	9.9982	0.0011
70	9.9984	0.0013

$$r \sin \phi' = A \sin \phi$$

$$r \cos \phi' = B \cos \phi$$

$$a = r \cos \phi' \sin (h - d)$$

$$b = r \cos \phi' \cos (h - d)$$

$$\log \lambda = 9.4192$$

$$u = a$$

$$u' = b \lambda$$

$$v = r \sin \phi' \cos D - b \sin D$$

$$v' = a \lambda \sin D$$

$$m \sin M = p - u$$

$$n \sin N = p' - u'$$

$$m \cos M = q - v$$

$$n \cos N = q' - v'$$

$$\log k = 9.4350$$

$$\cos \psi = \frac{m \sin (M - N)}{k}$$

$$Q = 90^\circ - N \mp \psi$$

$$t = -\frac{m}{n} \cos (M - N) \mp \frac{k \sin \psi}{n}$$

Upper signs for Immersion ; under signs for Emersion.

$$c \sin C = u + t u'$$

$$c \cos C = v + t v'$$

$$V = Q + C$$

Mean solar time of the star's apparent contact with the moon's limb

$$= T - d + t$$

$$\text{Angle from North Point} = Q$$

$$\text{Angle from Vertex} = V$$

The angle ψ is to be taken out positive and less than 180° . If $\log m \sin (M - N)$ be greater than $\log k$, $\cos \psi$ will evidently be greater than 1, or impossible, and there will be no occultation, except in some rare instances where the moon's limb passes very close to the star, when $\log \cos \psi$ will result very near 0. In these cases, a recalculation should be made according to the method which follows, using

$$t = -\frac{m}{n} \cos (M - N),$$

which may give $\log m \sin (M - N)$ less than $\log k$, when the star will be occulted. On the other hand, it may happen that, in these cases of very near approach, a first determination may give a $\cos \psi$ less than 1, which a recalculation will show to be impossible. The angle ψ is then to be considered $= 0^\circ$ when $m \sin (M - N)$ is positive, and we shall have $Q = 90^\circ - N$. When $m \sin (M - N)$ is negative, $\psi = 180^\circ$, or $Q = 90^\circ - N + 180^\circ = 270^\circ - N$. We shall also have, at the time of nearest approach,

$$\text{star's distance from moon's limb} = \pi (m \sin (M - N) - .2723),$$

in which π is the moon's horizontal parallax.

By *Angle from North Point* is to be understood the arc included between the star when in contact, and the point where the limb is intersected by an arc of a great circle passing from the moon's centre to the North Pole ; and by *Angle from Vertex*, the arc between the star at contact, and the point where the limb is intersected by an arc of a great circle passing from the moon's centre to the zenith. These angles are reckoned from the north point and from the vertex towards the *West* round the circumference of the moon's disc. For the image as seen in an inverting telescope, add to them 180° .

The results obtained by the above equations are only approximate, yet the computed times of immersion and emersion will usually be within one or two minutes of the truth. The error generally increases with the star's distance from the apparent path of the moon's centre and may, in some cases, amount to several minutes. For an immersion, this error is not of much consequence; but for an emersion, especially of a small star, the time should be determined with greater precision. For this purpose u' and v' must be computed with

$$h' - d = h - d + \frac{1}{2} \mu,$$

u being the symbol by which we express the sidereal equivalent of t in these equations.

$$\begin{aligned} u' &= r \cos \phi' \lambda \cos (h' - d) \\ v' &= r \cos \phi' \lambda \sin (h' - d) \sin D. \end{aligned}$$

Then with these values of u' and v' , recompute N , n , ψ , and t , by means of

$$\begin{aligned} n \sin N &= p' - u' \\ n \cos N &= q' - v' \\ \cos \psi &= \frac{n \sin (M - N)}{k} \end{aligned}$$

$$t = -\frac{m}{n} \cos (M - N) \mp \frac{k \sin \psi}{n}$$

using the M and m obtained by the first computation, and we shall have the time of contact $T - d + t$, generally within a few seconds of the truth.

As a check on the accuracy of the work, we might compute

$$\begin{aligned} u &= r \cos \phi' \sin (h - d + \mu) \\ v &= r \sin \phi' \cos D - r \cos \phi' \sin D \cos (h - d + \mu) \end{aligned}$$

and we should have

$$(p + t p' - u)^2 + (q + t q' - v)^2 = k^2 = 0.0741.$$

But if $m \sin M$, $m \cos M$, $\log n \sin N$, and $\log n \cos N$, have been correctly computed, we shall have the following shorter and more convenient check on the subsequent calculations for the time of contact:

$$(m \sin M + t n \sin N)^2 + (m \cos M + t n \cos N)^2 = k^2 = 0.0741.$$

The elements of computation, H , Y , etc., are given for the instant of the moon's true conjunction with the star in right ascension. It is desirable, however, in computing an occultation for a particular place, to assume a time for the calculation near to the time of the nearest approach of the moon's centre to the star, as seen at that place, and to reduce the elements to this assumed time. This time, for which the nearest tenth of an hour will be sufficiently accurate, will not differ greatly from the time of *apparent* conjunction, as affected by *parallax*, which may be determined approximately by the following equations. Let $T - d$ be the time of apparent conjunction; then

$$\begin{aligned} (t) &= \frac{\sin (H - d)}{p' \sec \phi - [9.4027] \cos (H - d)} \\ T - d &= \phi - d + (t). \end{aligned}$$

The elements corresponding to the time $T - d$ may then be obtained as follows.

$$\begin{aligned} h - d &= H - d + (\mu) \\ p &= (t) p' \\ q &= Y + (t) q' \end{aligned}$$

Where occultations are to be generally observed, as at astronomical stations, either temporary or permanent, the observer will find an advantage in looking over the list and selecting, beforehand, all those which may be visible at his station, by observing if his latitude be included between the *limiting parallels* for any given occultation, if the time ($T - d$) be favorable as regards the absence of daylight, and if the star's hour-angle ($h - d$) be not greater than its semidiurnal arc for the given latitude.

For obtaining the time

$$T - d = \delta - d + (t),$$

it will be well to tabulate the values of

$$(t) = \frac{\sin(H - d)}{p' \sec \phi - [9.4027] \cos(H - d)}$$

for every half-hour of ($H - d$) as far as the greatest semidiurnal arc computed for the latitude of the station with a declination of 30° ; and for all values of p' , using two decimal figures, from 0.50 to 0.60.

It will also be found advantageous to have tabulated values of

$$u = r \cos \phi' \sin(h - d) \\ u' = r \cos \phi' \lambda \cos(h - d)$$

which should be given for every minute (in time) of ($h - d$), from 0^h to 6^h . If ($h - d$) exceeds 6^h , the argument will be $12^h - (h - d)$, instead of ($h - d$). It will be seen by the equations that u will have the same sign as $\sin(h - d)$, and that u' will have the same sign as $\cos(h - d)$.

In the equation

$$v = r \sin \phi' \cos D - b \sin D$$

the term $r \sin \phi' \cos D$ may be tabulated for every tenth minute of declination, from 0° to 30° .

For a practical application of the preceding formulas, we will make the calculations for an occultation of the star α Cancri, January 6, 1863, as it will appear at Ann Arbor, Michigan, in north latitude $42^\circ 16'.8 = \phi$, and west longitude from Washington $0^h 26^m 41^s = d$.

The data for the computation are given on page 407, and, with the latitude and longitude of the place, are as follows:—

January 6. α Cancri. 4.

$\phi + 42^\circ 16'.8$	$H + 3^h 3^m 31^s$	$p' \quad 0.5249$
$d + 0^h 26'.7$	$d + 0^h 26^m 41^s$	$q' - 0.1772$
$\delta \quad 16 \quad 48.7$	$H - d + 2^h 36^m 50^s$	$\log \sin D + 9.3313$
$\delta - d \quad 16 \quad 22.0$	$Y + 0.8960$	$\log \cos D + 9.9898$

Calculation of the Time, $T - d$, and reduction of the elements of computation.

	$\log p' + 9.720$		$(t) + 1.2$
	$\log \sec \phi + 0.131$		
$\log p' \sec \phi =$	$\log (1) + 9.851$	(Reduced to hours and minutes)	$(t) + 1^h 12^m 0^s$
	$\log \text{constant} \quad 9.403$	Sidereal equivalent for (t)	$(\mu) + 1^h 12^m 12^s$
	$\log \cos (H - d) + 8.889$		$H - d + 2^h 36^m 50^s$
$\log [9.403] \cos (H - d) =$	$\log (2) + 9.292$	$H - d + (\mu) =$	$h - d + 3^h 49^m 2^s$
	$(2) + .196$		$\delta - d \quad 16 \quad 22.0$
	$(1) + .710$	$\delta - d + (t) =$	$T - d \quad 17 \quad 34.0$
$(1) - (2) =$	$(3) + .514$	$(t) p' = 1.2 \times 0.5429 =$	$p + 0.6299$
	$\log (3) + 9.711$		$Y + 0.8960$
	$\log \sin (H - d) + 9.801$	$-0.1772 \times 1.2 =$	$(t) q' - 0.2126$
$\log \frac{\sin (H - d)}{(8)} =$	$\log (t) + 0.090$	$Y + (t) q' =$	$q + 0.6834$
	63		

Calculation of the times of *Immersion* and *Emersion*, etc.

(Table, page 494, Arg. ϕ)	$\log A$	9.9977	$\log m \sin M$	+7.8325	
	$\log \sin \phi$	+9.8279	$\log m \cos M$	+9.0630	
$\log A \sin \phi =$	$\log r \sin \phi'$	+9.8256	$\log \tan M$	+8.7695	
	$\log \cos D$	+9.9898	$\log \cos M$	+9.9992	
	$\log r \sin \phi' \cos D$	+9.8154	$\log m$	+9.0638	
(Table, page 494, Arg. ϕ)	$\log B$	0.0007	$\log n \sin N$	+9.6229	
	$\log \cos \phi$	+9.8691	$\log n \cos N$	-9.3269	
$\log B \cos \phi =$	$\log r \cos \phi'$	+9.8698	$\log \tan N$	-0.2960	
	$\log \sin (h - d)$	+9.9248	$\log \sin N$	+9.9505	
$\log r \cos \phi' \sin (h - d) = \log u = \log a$	+9.7946		$\log n$	+9.6724	
	$\log \cos (h - d)$	+9.7331	$-\log \frac{m}{n}$	-9.3914	
$\log r \cos \phi' \cos (h - d) =$	$\log b$	+9.6029	$\log \cos (M - N)$	-9.6001	
	$\log \lambda$	9.4192	$-\log \frac{m}{n} \cos (M - N) =$	$\log (1)$	+8.9915
	$\log a \lambda$	+9.2138		$\log \sin (M - N)$	-9.9625
	$\log \sin D$	+9.3313		$\log m \sin (M - N)$	-9.0263
	$\log b \sin D$	+8.9342		$\log k$	9.4350
$\log a \lambda \sin D =$	$\log v'$	+8.5451	$\log \frac{m \sin (M - N)}{k} =$	$\log \cos \psi$	-9.5913
$\log b \lambda =$	$\log u'$	+9.0221		$\log \sin \psi$	+9.9641
	$r \sin \phi' \cos D$	+ .6537		$\log k \sin \psi$	+9.3991
	$b \sin D$	+ .0859	$\log \frac{k \sin \psi}{n} =$	$\log (2)$	+9.7267
$r \sin \phi' \cos D - b \sin D =$	v	+ .5678		(1) +	.0981
	q	+ .6834		(2) +	.5329
$q - v =$	$m \cos M$	+ .1156	For Immersion, (1) - (2) =	t_1	- .4348
	p	+ .6299	For Emersion, (1) + (2) =	t_2	+ .6310
	u	+ .6231		$\log t_1$	-9.6383
$p - u =$	$m \sin M$	+ .0068		$\log u'$	+9.0221
	q'	- .1772		$\log t_1 u'$	-8.6604
	v'	+ .0351		$\log v'$	+8.5451
$q' - v' =$	$n \cos N$	- .2123		$\log t_1 v'$	-8.1834
	p'	+ .5249		$t_1 v'$	- .0153
	u'	+ .1052		v	+ .5678
$p' - u' =$	$n \sin N$	+ .4197	$v + t_1 v' =$	$c \cos C$	+ .5525
	M	3° 22'		$t_1 u'$	- .0457
	N	116 50		u	+ .6231
	$M - N$	246 32	$u + t_1 u' =$	$c \sin C$	+ .5774
	90° - N	333 10		$\log c \sin C$	+9.7615
	ψ	112 58		$\log c \cos C$	+9.7423
For Immersion, 90° - $N - \psi = Q$	220 12			$\log \tan C$	+0.0192
				$T - d$	17 34.0
			(Reduced to hours and minutes,)	t_1	- 0 26.1
IMMERSION: Ann Arbor Mean Time,			$T - d + t_1$	17 7.9	
				$C + 46^{\circ} 16'$	
Immersion Angle from North Point =			Q	220 12	
Immersion Angle from Vertex = $Q + C =$			V	266 28	
				t_2	+ 0 37.9
			(Reduced to hours and minutes,)	$T - d + t_2$	18 11.9
EMERSION: Ann Arbor Mean Time,					

Calculation of a more accurate time, etc., of *Emersion*.

	$h - d + 3 \begin{smallmatrix} h \\ 49 \end{smallmatrix} \begin{smallmatrix} m \\ 2 \end{smallmatrix}$	From first determination,	$M \begin{smallmatrix} 3 \\ 22 \end{smallmatrix}$
Sidereal equiv. for $\frac{1}{2} t_2 =$	$\frac{1}{2} \mu_2 + 18 \ 59$		$N \ 116 \ 16$
$h - d + \frac{1}{2} \mu =$	$h' - d + 4 \ 8 \ 1$		$M - N \ 247 \ 6$
	$\log \cos (h' - d) + 9.6715$		$90^\circ - N \ 333 \ 44$
	$\log r \cos \phi' + 9.8698$		$\psi \ 113 \ 4$
	$\log \lambda \ 9.4192$	For Emersion, $90^\circ - N + \psi =$	$Q \ 86 \ 48$
$\log r \cos \phi' \lambda \cos (h' - d) =$	$\log u' + 8.9605$		(1) + .0932
	$\log \sin (h' - d) + 9.9459$		(2) + .5181
	$\log r \cos \phi' \lambda + 9.2890$	(1) + (2) =	$t + .6113$
	$\log \sin D + 9.3313$		$\log t + 9.7862$
$\log r \cos \phi' \lambda \sin (h' - d) \sin D =$	$\log v' + 8.5662$		$\log n \sin N + 9.6371$
	$v' + .0368$		$\log n \sin N + 9.4233$
	$q' - .1772$		$\log n \cos N - 9.3304$
$q' - v' =$	$n \cos N - .2140$		$\log n \cos N - 9.1166$
	$u' + .0913$		$n \cos N - .1308$
	$p' + .5249$	From first determination,	$m \cos M + n \cos N =$
$p' - u' =$	$n \sin N + .4336$		(3) .0152
	$\log n \sin N + 9.6371$		$n \cos M + .1156$
	$\log n \cos N - 9.3304$	From first determination,	$n \sin N + .2651$
	$\log \tan N - 0.3067$		$m \sin M + .0068$
	$\log \sin N + 9.9527$		(4) .2719
	$\log n + 9.6844$		(4) ² .0739
From first determination,	$\log m + 9.0638$		(3) ² .0002
	$-\log \frac{m}{n} - 9.3794$	(3) ² + (4) ² = $k^2 = 0.0741$,	Check .0741
	$\log \cos (M - N) - 9.5901$		$\log u' + 8.9605$
	$\log \sin (M - N) - 9.9643$		$\log t u' + 8.7467$
	$\log m \sin (M - N) - 9.0281$		$\log v' + 8.5662$
	$\log k \ 9.4350$		$\log t v' + 8.3524$
$\log \frac{m \sin (M - N)}{k} =$	$\log \cos \psi - 9.5931$	From first determination,	$t v' + .0225$
	$\log \sin \psi + 9.9638$		$v + .5678$
	$\log k \sin \psi + 9.3988$		$c \cos C + .5903$
$\log \frac{k \sin \psi}{n} =$	$\log (2) + 9.7144$	From first determination,	$t u' + .0558$
$-\log \frac{m}{n} \cos (M - N) =$	$\log (1) + 8.9695$		$u + .6231$
			$c \sin C + .6789$
			$\log c \sin C + 9.8318$
			$\log c \cos C + 9.7711$
			$\log \tan C + 0.0607$
			$T - d \begin{smallmatrix} h \\ 17 \end{smallmatrix} \begin{smallmatrix} m \\ 34.0 \end{smallmatrix}$
		(Reduced to hours and minutes,)	$t + 0 \ 36.7$
EMERSION: Ann Arbor Mean Time,			$T - d + t \ 18 \ 10.7$
			$C + 49^\circ \ 0'$
Emersion Angle from North Point, =			$Q \ 86 \ 48$
Emersion Angle from Vertex = $Q + V =$			$V \ 135 \ 48$

The last two pages of the Occultations contain a list of such Occultations as will be visible at Washington during the year 1863.

The Tables of *Jupiter's Satellites* embrace, —

A list of the occultations, eclipses, transits, and transits of shadows, in the order of the time of the occurrence of the phenomena for the satellites taken promiscuously. They are given for every month, accompanied with a diagram, constructed for the eclipse which occurs nearest the middle of the month, showing the phases of the eclipses for an inverting telescope.

A table containing the mean time of the geocentric superior conjunction, and the rectangu-

lar coördinates of the satellites corresponding to the time from the next preceding superior conjunction, at intervals of twenty minutes for the first satellite, of forty minutes for the second, of one hour and twenty minutes for the third, and of three hours for the fourth satellite. They are also given for the time of eclipse for the first, second, and third satellites at intervals of seven days, and for the fourth for every eclipse. They enable the astronomer to obtain the configurations at all times. They are given in seconds of arc.

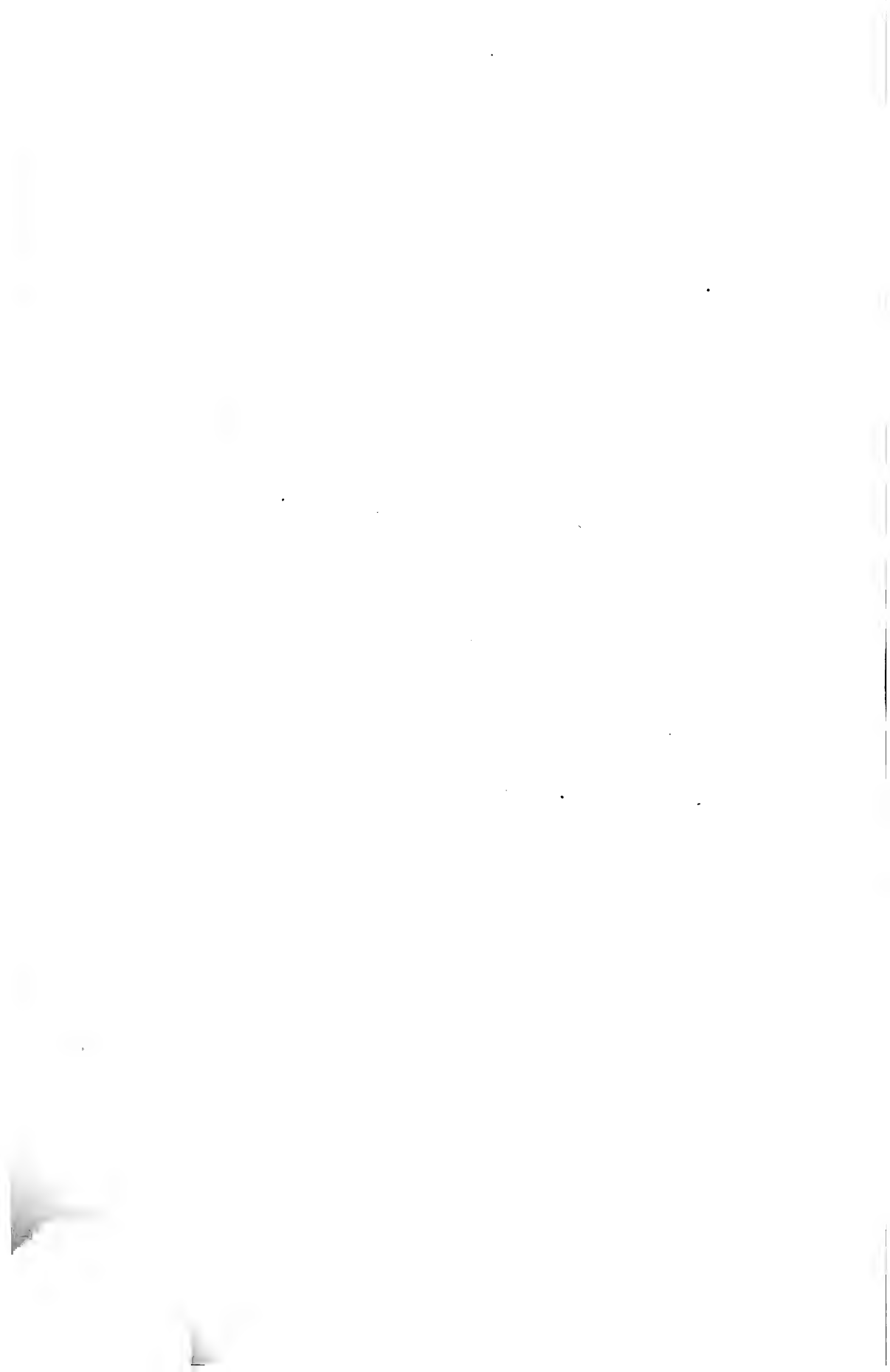
The coördinates have their origin in the centre of the primary, and are referred to the major and minor axes of the apparent ellipse described by the path of the satellite.

The major axis of this ellipse is constant, for the earth's mean place; but the minor axis takes all values from the positive and negative maxima to zero, owing to the changes in the earth's elevation above the plane of the satellite's orbit.

The values in the table correspond to the maximum value of the conjugate axis, as seen from the sun or that of the mean maximum for the earth (which is a constant value). Factors are given in an adjoining column, at intervals of seven days for the first, second, and third satellites, and seventeen days for the fourth, to reduce the above values to those corresponding to the axis for the time being; also for the same intervals, the angle of inclination of the northern semi-minor axis to the circle of declination.

x is positive after superior conjunction, or on the east side of the planet, negative before superior conjunction, or on the west side. y will be positive north, negative south. The eclipses, occultations, &c. of the satellites, visible at Washington, that is, those which occur when the sun is 8° below and Jupiter 8° above the horizon, are distinguished by a W. placed after the name of the phase.

A P P E N D I X.



CONSTRUCTION OF THE ASTRONOMICAL AND NAUTICAL EPHEMERIDES FOR 1863.

THE Precession of the Equinoxes adopted in this volume is taken from STRUVE and PETERS; * it is,

$$\text{Precession} = 50''.2411 + 0''.0002268 t,$$

in which t is the number of years after 1800.

The Mean Obliquity of the Ecliptic is also taken from STRUVE and PETERS, and its value is, †

$$\text{Obliquity} = 23^\circ 27' 54''.22 - 0''.4645 t - 0''.0000014 t^2.$$

The constant of aberration is that of STRUVE, and is, ‡

$$\text{Aberration} = 20''.4451 \pm 0''.0111.$$

The Nutation of the Apparent Obliquity and the Equation of the Equinoxes are computed from PETERS' formulas given in his *Numerus Constans Nutationis*. § These formulas are reprinted in the volume of this ephemeris for 1855.

Of the Mean Places of 100 Fixed Stars, thirty-three have been taken from LE VERRIER's list of Fundamental Stars, *Annales de l'Observatoire Impériale de Paris*, Vol. II.; nine from a list of Circumpolar Stars prepared by Dr. GOULD, *U. S. Coast Survey Report*, 1855; and the remainder from the list of stars in the *English Nautical Almanac* for 1855, combined with that given in the *Astronomical Observations made during the Year 1846 at the National Observatory, Washington*.

The Apparent Places of the Fixed Stars have been obtained by means of PETERS' formulas, which are given on page 255.

The place of Sirius is corrected by the following formula, given by PETERS, for the variability of its motion in right ascension compared with those of β Orionis, α Orionis, and Procyon.

$$\text{Variation of right ascension} = 0''.101 + 0''.00072 t + 0''.170 \sin. (\kappa + 92^\circ 18');$$

in which

* PETERS' *Numerus Constans Nutationis*, p. 71.

† Ibid., pp. 66 and 71.

‡ STRUVE's *Constant de l'Aberration*, p. 47.

§ PETERS' *Numerus Constans Nutationis*, pp. 46-48.

APPENDIX.

u = the eccentric anomaly from the inferior apsis. It is found from the elements,

Mean annual motion of Sirius in its orbit	= $7^{\circ}.3104 \pm 0^{\circ}.2162$
Period of its revolution	= $49^{\circ}.245 \pm 1^{\circ}.456$
Passage through the inferior apsis	= $1792.819 \pm 2^{\circ}.039$
Eccentricity	= 0.5647 ± 0.0827

The List of Moon-Culminating Stars is large, and so arranged in a systematic form as to permit the observer a great range for selection.

The Ephemeris of the Sun is constructed from the Tables of HANSEN and OLUFSEN, Copenhagen, 1853. In the Computation of the Sun's Geocentric Coördinates, regard has been had to the Sun's latitude; the computation has been made by means of the formulas given in the *Construction of the Almanac for 1855*.

ENCKE's discussion of the Transits of Venus in 1761 and 1769, in his *Der Venusdurchgang von 1769, &c.*, has furnished the standard

Equatorial Horizontal Parallax at the Earth's Mean Distance = $8''.5776$.

The Sun's Semidiameter at the Earth's Mean Distance has been taken equal to $16' 2''$.

For reducing observations of different observers, the following corrections may be added:—

For Greenwich Mural Circle, H.	+ 0.21
“ “ “ “ H. B.	— 0.43
“ “ “ “ F.	— 0.86
“ “ “ “ E.	+ 0.17
“ “ “ “ R.	— 0.57
“ “ “ “ G.	— 0.18
“ “ “ “ I. H.	— 0.87
“ “ “ “ D.	— 0.61
“ “ “ “ W. R.	+ 0.49
“ “ “ “ P.	— 1.28
Königsberg Meridian Circle, Bessel	— 1.10
Dorpat “ “ W. Struve	— 1.36
Washington Mural Circle, Prof. Coffin	+ 1.00
“ “ “ Lieut. Page	+ 1.00
Washington Meridian Circle, Prof. Hubbard	— 0.41

The Ephemeris of the Moon has been constructed from PEIRCE's *Tables of the Moon*, with the *Tables of the Moon's Parallax*, constructed from WALKER's and ADAMS's formulas, and arranged as a Supplement to the first edition of PEIRCE's *Tables of the Moon*.

The Semidiameter of the Moon at the Earth's Mean Distance is taken to be $\frac{1}{100}$ part greater than that given by BURCKHARDT, although that given by BURCKHARDT is probably better adapted to the computation of eclipses and occultations.

CONSTRUCTION OF THE ALMANAC.

The Ephemeris of Mercury has been constructed from the theory of LE VERRIER, published in the *Additions to the Connaissance des Temps* for 1848, without any alteration. Tables have been computed from LE VERRIER's formulas for this purpose.

The Ephemeris of Venus has been derived from manuscript Tables, constructed from LINDENAU's Tables, in a form similar to that adopted for the Lunar Tables; applying AIRY's Long Equation and the corrections proceeding from the discussion, by the method of Least Squares, of Mr. HUGH BREEN's results contained in his paper on the *Corrections of LINDENAU's Elements of the Orbit of Venus, &c.*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XVIII.; and adopting the secular variations of the elements from LE VERRIER's *Memoir on the Determination of the Secular Inequalities of the Planets*, which appeared in the *Connaissance des Temps* for the year 1844. The following are the corresponding corrected elements, and annual variations for Washington, 1855.0.

$$\begin{aligned} L &= 289^{\circ} 51' 53''.5 \\ \pi &= 129\ 32\ 59.6 + 49''.57459\ t. \\ \Omega &= 75\ 23\ 27.3 + 32.88424\ t. \\ i &= 3\ 23\ 34.6 + 0.04363\ t. \\ e &= 1410''.6847 - 0.11157\ t. \\ n &= 2106641.438 \\ a &= 0.7233323 \end{aligned}$$

The Ephemeris of Mars is derived from manuscript Tables constructed from LINDENAU's Tables in the same manner as the Tables of Venus. Mr. HUGH BREEN's results contained in his paper *On the Corrections of LINDENAU's Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX., have also been discussed and applied; and LE VERRIER's secular variations of the elements are likewise adopted. The following are the corresponding corrected elements, and secular variations for Washington, 1855.0.

$$\begin{aligned} L &= 320^{\circ} 13' 33''.71 \\ \pi &= 333\ 23\ 17.80 + 65''.99145\ t. \\ \Omega &= 48\ 25\ 55.18 + 27.68294\ t. \\ i &= 1\ 51\ 2.20 - 0.02141\ t. \\ e &= 19238''.75 + 0.18549\ t. \\ n &= 689050.9023 \\ a &= 1.5236878 \end{aligned}$$

The Ephemeris of Jupiter is derived from manuscript Tables constructed from BOUVARD's Tables, with such changes as were required to make them correspond more nearly to the formulas.

The Ephemeris of Saturn is also derived from manuscript Tables constructed from the Tables of BOUVARD, with changes having the same object. The mass of Jupiter given by BESSEL has been adopted and used.

$$\text{This mass} = \frac{1}{1047.879 \pm 0.235} \text{ of the sun's mass.}$$

The following corrections of the elements have also been introduced for 1863:—

APPENDIX.

corr. mean long.	= +4'.9
corr. long. of node	= -143".4
corr. inclination	= -5".7.

The Ephemeris of Uranus is derived from the elliptical portion of BOUVARD'S Tables, with LE VERRIER'S corrections and perturbations caused by Jupiter and Saturn, contained in his *Recherches sur les Mouvements de la Planète Herschel (dite Uranus)*, published in the *Connaissance des Temps* for 1849, and also PEIRCE'S corrections and perturbations arising from the influence of Neptune,

The combined corrections of the elements deduced by PEIRCE for January 1, 1800, are as follows :—

corr. mean distance	= +0.000942
corr. mean motion	= -1".13560
corr. eccentricity	= -0.0003626
corr. long. of per.	= +8252".4
corr. long. of epoch	= +2575".4.

The Ephemeris of Neptune is derived from PEIRCE'S theory and WALKER'S orbit.

The eclipses and elongations of Jupiter's Satellites are computed from DAMOISEAU'S Tables.

The vertical semidiameters of the Planets are computed from the following values :—

Vertical Semidiameter.	Log. Dist.	Authority
Mercury 3.34	0.00	LE VERRIER, <i>Theory of Mercury</i> . PEIRCE, from the Washington Observations of 1845 and 1846, made with the mural circle.
Venus 8.546 ± 0.086	0.00	
Mars 2.842 ± 0.057	0.25	
Jupiter 18.78 ± 0.067	0.70	
Saturn 8.77 ± 0.039	0.95	
Uranus 1.68 ± 0.3	1.30	

To correspond to the apparent semidiameters observed with the Washington mural circle, all the semidiameters, except those of Mercury, computed from these values, must be increased by a constant quantity = 0".57.

The apparent elements of Saturn's Rings are computed from BESSEL'S data, except those for BOND'S dusky ring.

The elements of the eclipse are adapted to the neat and simple modification of BESSEL'S formulas, suggested by T. HENRY SAFFORD, Jr.

The elements adapted to BESSEL'S formulas are given for all occultations of stars greater than those of the sixth magnitude

The Heliocentric Coördinates of the Planets are given for the computation of perturbations, and the following are the values of the masses, that of the Sun being unity :—

Mercury	$\frac{1}{4865751}$	ENCER, <i>A. N.</i> , No. 443.
Venus	$\frac{1}{390000}$	LE VERRIER, <i>Théor. de Merc.</i> , p. 115.

CONSTRUCTION OF THE ALMANAC.

The Earth	$\frac{1}{354936}$	LE VERRIER, <i>Théor. de Merc.</i> , p. 26.
Mars	$\frac{1}{2680637}$	BURCKHARDT, <i>Conn. des Temps</i> , 1816, p. 343.
Jupiter	$\frac{1}{1047.879 \pm 0.235}$	BESSEL, <i>Die Masse des Jupiter</i> , p. 64.
Saturn	$\frac{1}{3501.6}$	BESSEL, <i>Comptes Rendus</i> , 1841.
Uranus	$\frac{1}{24905}$	LAMONT, <i>Mem. Ast. Soc.</i> , Vol. XI. p. 54.
Neptune	$\frac{1}{18780}$	PEIRCE, <i>Am. Ac. Proc.</i> , Vol. I. p. 333.

The intervals of original computation have in all cases been made sufficiently small to authorize the use of the differences as a check of the accuracy of the work. The results have also been tested, in various portions, by means of duplicate computations. The proofs from the electrotype plates have been thoroughly examined by an independent series of differences. And it is believed that, in every respect, that system has been adopted in which accuracy was most likely to be secured.

The principal computations of the Ephemeris have been distributed in the following manner.

The Sun has been computed by Mr. EASTWOOD; the Ephemeris of the Moon, by Mr. RUNKLE, Mr. WRIGHT, Mr. FERREL, and Mr. NEWCOMB; the Moon Culminations, by Mr. LOOMIS; the Moon-Culminating Stars, by Mr. BARTLETT; and the Lunar Distances, by Mr. RUNKLE, Mr. WRIGHT, Mr. FERREL, Mr. NEWCOMB, and Mr. LOOMIS. Mercury has been computed by Mr. BRADFORD and Mr. BARTLETT, Venus by Miss MITCHELL, Mars by Mr. EASTWOOD, Jupiter by Professor KENDALL, Saturn by Professor VAN VLECK, Uranus by Mr. FERREL, and Neptune by Professor KENDALL. The Fixed Stars and the General Constants for Reduction have been computed by Mr. SPRAGUE, and the Occultations by Mr. DOWNES. The Eclipses have been computed and the Charts projected by Mr. WRIGHT. The Table of Geographical Positions of the Principal Observatories has been prepared by Dr. GOULD.

EQUATOR TO ECLIPTIC.

TABLE FOR CHANGING LATITUDE AND LONGITUDE TO RIGHT ASCENSION AND DECLINATION, OR THE REVERSE.

λ	λ	A	a	Diff.	Log. a	Diff.	b	Log. b	B	Diff.	λ	λ
$^{\circ}$	h. m.	$^{\circ}$	$^{\circ}$						$^{\circ}$		h. m.	$^{\circ}$
0	0 0	0 0.0	0.3981	1	9.6000	1	0.9173	9.9625	0 0.0	26.0	12 0	180
1	0 4	0 5.4	0.3980	2	9.5999	2	0.9174	9.9626	0 26.0	26.1	11 56	179
2	0 8	0 10.8	0.3978	3	9.5997	3	0.9175	9.9626	0 52.1	26.0	11 52	178
3	0 12	0 16.2	0.3975	4	9.5994	4	0.9176	9.9627	1 18.1	25.9	11 48	177
4	0 16	0 21.5	0.3971	5	9.5989	5	0.9178	9.9627	1 44.0	25.9	11 44	176
5	0 20	0 26.9	0.3966	7	9.5983	7	0.9180	9.9628	2 9.9	25.9	11 40	175
6	0 24	0 32.2	0.3959	8	9.5976	8	0.9183	9.9630	2 35.8	25.8	11 36	174
7	0 28	0 37.4	0.3951	9	9.5967	9	0.9186	9.9631	3 1.6	25.8	11 32	173
8	0 32	0 42.6	0.3942	10	9.5957	10	0.9190	9.9633	3 27.4	25.6	11 28	172
9	0 36	0 47.7	0.3932	13	9.5946	13	0.9195	9.9635	3 53.0	25.6	11 24	171
10	0 40	0 52.8	0.3920	13	9.5933	14	0.9200	9.9638	4 18.6	25.4	11 20	170
11	0 44	0 57.8	0.3907	13	9.5919	15	0.9205	9.9640	4 44.0	25.3	11 16	169
12	0 48	1 2.7	0.3894	15	9.5904	17	0.9211	9.9643	5 9.3	25.2	11 12	168
13	0 52	1 7.5	0.3879	16	9.5887	18	0.9217	9.9646	5 34.5	25.1	11 8	167
14	0 56	1 12.3	0.3863	17	9.5869	20	0.9224	9.9649	5 59.6	24.9	11 4	166
15	1 0	1 17.0	0.3846	19	9.5849	21	0.9231	9.9652	6 24.5	24.8	11 0	165
16	1 4	1 21.5	0.3827	20	9.5828	22	0.9239	9.9656	6 49.3	24.6	10 56	164
17	1 8	1 25.9	0.3807	21	9.5806	24	0.9247	9.9660	7 13.9	24.4	10 52	163
18	1 12	1 30.2	0.3786	22	9.5782	25	0.9256	9.9664	7 38.3	24.2	10 48	162
19	1 16	1 34.4	0.3764	23	9.5757	27	0.9265	9.9668	8 2.5	24.0	10 44	161
20	1 20	1 38.5	0.3741	24	9.5730	29	0.9274	9.9673	8 26.5	23.9	10 40	160
21	1 24	1 42.4	0.3717	26	9.5701	30	0.9284	9.9677	8 50.4	23.6	10 36	159
22	1 28	1 46.2	0.3691	27	9.5671	31	0.9294	9.9682	9 14.0	23.4	10 32	158
23	1 32	1 49.9	0.3664	27	9.5640	33	0.9304	9.9687	9 37.4	23.3	10 28	157
24	1 36	1 53.4	0.3637	29	9.5607	35	0.9315	9.9692	10 0.6	22.9	10 24	156
25	1 40	1 56.7	0.3608	30	9.5572	36	0.9326	9.9697	10 23.5	22.7	10 20	155
26	1 44	1 59.9	0.3578	31	9.5536	38	0.9338	9.9703	10 46.2	22.5	10 16	154
27	1 48	2 2.9	0.3547	32	9.5498	39	0.9350	9.9708	11 8.7	22.2	10 12	153
28	1 52	2 5.8	0.3515	33	9.5459	41	0.9362	9.9714	11 30.9	21.9	10 8	152
29	1 56	2 8.5	0.3482	34	9.5418	43	0.9374	9.9719	11 52.8	21.7	10 4	151
30	2 0	2 11.1	0.3448	35	9.5375	45	0.9387	9.9725	12 14.5	21.4	10 0	150
31	2 4	2 13.5	0.3413	37	9.5330	46	0.9400	9.9731	12 35.9	21.1	9 56	149
32	2 8	2 15.7	0.3376	38	9.5284	48	0.9413	9.9737	12 57.0	20.8	9 52	148
33	2 12	2 17.7	0.3338	38	9.5236	51	0.9426	9.9743	13 17.8	20.6	9 48	147
34	2 16	2 19.6	0.3300	39	9.5185	52	0.9440	9.9750	13 38.4	20.2	9 44	146
35	2 20	2 21.3	0.3261	40	9.5133	54	0.9453	9.9756	13 58.6	20.0	9 40	145
36	2 24	2 22.8	0.3221	41	9.5079	56	0.9467	9.9762	14 18.6	19.6	9 36	144
37	2 28	2 24.1	0.3180	43	9.5023	58	0.9481	9.9768	14 38.2	19.3	9 32	143
38	2 32	2 25.2	0.3137	44	9.4965	60	0.9495	9.9775	14 57.5	19.0	9 28	142
39	2 36	2 26.2	0.3093	44	9.4905	63	0.9509	9.9781	15 16.5	18.6	9 24	141
40	2 40	2 27.0	0.3049	45	9.4842	65	0.9524	9.9788	15 35.1	18.4	9 20	140
41	2 44	2 27.6	0.3004	46	9.4777	67	0.9538	9.9794	15 53.5	18.0	9 16	139
42	2 48	2 28.0	0.2958	47	9.4710	69	0.9552	9.9801	16 11.5	17.7	9 12	138
43	2 52	2 28.2	0.2911	47	9.4641	72	0.9566	9.9807	16 29.2	17.3	9 8	137
44	2 56	2 28.2	0.2864	49	9.4569	74	0.9581	9.9814	16 46.5	17.0	9 4	136
45	3 0	2 28.1	0.2815	50	9.4495	78	0.9595	9.9820	17 3.5	16.7	9 0	135
46	3 4	2 27.8	0.2765	50	9.4417	80	0.9610	9.9827	17 20.2	16.3	8 56	134
47	3 8	2 27.3	0.2715	51	9.4337	82	0.9625	9.9834	17 36.5	15.9	8 52	133
48	3 12	2 26.6	0.2664	52	9.4255	86	0.9639	9.9840	17 52.4	15.6	8 48	132
49	3 16	2 25.8	0.2612	53	9.4169	89	0.9653	9.9847	18 8.0	15.3	8 44	131
50	3 20	2 24.8	0.2559	54	9.4080	92	0.9667	9.9853	18 23.3	14.9	8 40	130
51	3 24	2 23.6	0.2505	54	9.3988	95	0.9681	9.9859	18 38.2	14.5	8 36	129
52	3 28	2 22.2	0.2451	55	9.3893	99	0.9695	9.9865	18 52.7	14.2	8 32	128
53	3 32	2 20.7	0.2396	56	9.3794	102	0.9709	9.9872	19 6.9	13.8	8 28	127
54	3 36	2 19.0	0.2340	57	9.3692	106	0.9722	9.9878	19 20.7	13.4	8 24	126
55	3 40	2 17.1	0.2283	57	9.3586	111	0.9736	9.9884	19 34.1	13.1	8 20	125

EQUATOR TO ECLIPTIC.

TABLE FOR CHANGING LATITUDE AND LONGITUDE TO RIGHT ASCENSION AND DECLINATION, OR THE REVERSE.

k	k	A	α	Diff.	Log. α	Diff.	b	Log. b	B	Diff.	k	k
$^{\circ}$	$h. m.$	$^{\circ}$	$'$						$^{\circ}$	$'$	$h. m.$	$^{\circ}$
56	3 44	2 15.1	0.2226	58	9.3475	114	0.9749	9.9890	19 47.2	12.7	8 16	124
57	3 48	2 13.0	0.2168	59	9.3361	119	0.9762	9.9895	19 59.9	12.3	8 12	123
58	3 52	2 10.7	0.2109	59	9.3242	124	0.9775	9.9901	20 12.2	12.0	8 8	122
59	3 56	2 8.2	0.2050	60	9.3118	129	0.9788	9.9907	20 24.2	11.6	8 4	121
60	4 0	2 5.6	0.1990	60	9.2989	134	0.9800	9.9912	20 35.8	11.2	8 0	120
61	4 4	2 2.8	0.1930	61	9.2855	139	0.9812	9.9918	20 47.0	10.9	7 56	119
62	4 8	1 59.9	0.1896	62	9.2716	146	0.9824	9.9923	20 57.9	10.4	7 52	118
63	4 12	1 56.9	0.1807	62	9.2570	152	0.9836	9.9928	21 8.3	10.1	7 48	117
64	4 16	1 53.7	0.1745	63	9.2418	159	0.9847	9.9933	21 18.4	9.7	7 44	116
65	4 20	1 50.4	0.1682	63	9.2259	166	0.9858	9.9938	21 28.1	9.4	7 40	115
66	4 24	1 47.0	0.1619	64	9.2093	175	0.9868	9.9942	21 37.5	8.9	7 36	114
67	4 28	1 43.5	0.1555	64	9.1918	183	0.9878	9.9947	21 46.4	8.6	7 32	113
68	4 32	1 39.8	0.1491	64	9.1735	192	0.9888	9.9951	21 55.0	8.2	7 28	112
69	4 36	1 36.1	0.1427	65	9.1543	203	0.9898	9.9955	22 3.2	7.9	7 24	111
70	4 40	1 32.2	0.1362	66	9.1340	214	0.9907	9.9959	22 11.1	7.4	7 20	110
71	4 44	1 28.2	0.1296	66	9.1126	227	0.9916	9.9963	22 18.5	7.1	7 16	109
72	4 48	1 24.0	0.1230	66	9.0899	240	0.9924	9.9967	22 25.6	6.7	7 12	108
73	4 52	1 20.0	0.1164	67	9.0659	256	0.9932	9.9970	22 32.3	6.3	7 8	107
74	4 56	1 15.7	0.1097	67	9.0403	273	0.9940	9.9974	22 38.6	5.9	7 4	106
75	5 0	1 11.4	0.1030	67	9.0130	294	0.9947	9.9977	22 44.5	5.6	7 0	105
76	5 4	1 7.0	0.0963	67	8.9836	315	0.9954	9.9980	22 50.1	5.1	6 56	104
77	5 8	1 2.5	0.0896	68	8.9521	342	0.9960	9.9982	22 55.2	4.8	6 52	103
78	5 12	0 58.0	0.0828	68	8.9179	373	0.9966	9.9985	23 0.0	4.4	6 48	102
79	5 16	0 53.4	0.0760	69	8.8806	410	0.9971	9.9987	23 4.4	4.0	6 44	101
80	5 20	0 48.7	0.0691	68	8.8396	453	0.9976	9.9990	23 8.4	3.6	6 40	100
81	5 24	0 44.0	0.0623	69	8.7943	508	0.9981	9.9992	23 12.0	3.3	6 36	99
82	5 28	0 39.2	0.0554	69	8.7435	576	0.9985	9.9993	23 15.3	2.8	6 32	98
83	5 32	0 34.4	0.0485	69	8.6859	667	0.9988	9.9995	23 18.1	2.5	6 28	97
84	5 36	0 29.6	0.0416	69	8.6192	789	0.9991	9.9996	23 20.6	2.1	6 24	96
85	5 40	0 24.7	0.0347	69	8.5403	967	0.9994	9.9997	23 22.7	1.7	6 20	95
86	5 44	0 19.3	0.0278	69	8.4436	1248	0.9996	9.9998	23 24.4	1.3	6 16	94
87	5 48	0 14.9	0.0209	70	8.3188	1760	0.9998	9.9999	23 25.7	1.0	6 12	93
88	5 52	0 9.9	0.0139	69	8.1428	3010	0.9999	0.0000	23 26.7	0.6	6 8	92
89	5 56	0 5.0	0.0070	70	7.8418		1.0000	0.0000	23 27.3	0.2	6 4	91
90	6 0	0 0.0	0.0000				1.0000	0.0000	23 27.5		6 0	90

This table is computed for an obliquity of $23^{\circ} 27' 30''$.

The argument k is either the longitude or the right ascension, or their excess above 180° or 12^h .

Right ascension (α) and declination (δ) are converted into longitude (λ) and latitude (β) by the formulæ

$$k = \alpha \text{ or } \alpha - 12^h.$$

$$\tan. p = \alpha \tan. (\delta - B)$$

$$\tan. \beta = b \tan. (\delta - B) \cos. p$$

$$\lambda = \alpha + A + p$$

in which the sign of α is that of $\cos. \alpha$

the sign of B is that of $\sin. \alpha$

the sign of A is that of $\tan. \alpha$

Longitude (λ) and latitude (β) are converted into right ascension and declination by the formulæ

$$k = \lambda = \lambda - 180^{\circ}$$

$$\tan. g = \alpha \tan. (\beta + B)$$

$$\tan. \delta = b \tan. (\beta + B) \cos. g$$

$$\alpha = \lambda + A - g$$

in which the sign of α is that of $\cos. \lambda$

the sign of B is that of $\sin. \lambda$

the sign of A is that of $\tan. \lambda$

The following approximate formulæ can be used when β is less than 10° .

$$\beta = b (\delta - B)$$

$$\lambda = \alpha + A + \alpha (\delta - B) \sec. \beta$$

and the factor $\sec. \beta$ can be neglected when β is less than 4° .

MOON'S LIBRATION.

TABLE FOR THE LIBRATION OF THE MOON.

$\Omega - \lambda$	$\Delta \lambda$	α^{-1}	B	$\Omega - \lambda$	$\Omega - \lambda$	$\Delta \lambda$	α^{-1}	B	$\Omega - \lambda$
0	0.0	39	0 0.0	180	46	0.6	56	1 3.9	134
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					

$\Delta \lambda$ has the sign of $\tan. (\Omega - \lambda)$
 α has the sign of $\cos. (\Omega - \lambda)$
 B has the sign of $\sin. (\Omega - \lambda)$

When $\Omega - \lambda$ exceeds 180° the table is to be entered with $(\Omega - \lambda) - 180^\circ$ as the argument in the column $\Omega - \lambda$.

MOON'S MEAN MOTION.

MOON'S MEAN MOTION IN LONGITUDE FOR SIDEREAL INTERVALS.					
Day.	C's Motion in Longitude.	Minutes.	C's Motion in Longitude.	Minutes.	C's Motion in Longitude.
1	13 8.4	1	0.5	30	16.4
2	26 16.9	2	1.1	31	17.0
3	39 25.3	3	1.6	32	17.5
4	52 33.7	4	2.2	33	18.1
5	65 42.1	5	2.7	34	18.6
				35	19.2
6	78 50.6	6	3.3	36	19.7
7	91 59.0	7	3.8	37	20.3
8	105 7.4	8	4.4	38	20.8
9	118 15.8	9	4.9	39	21.4
10	131 24.3	10	5.5	40	21.9
Hour.		11	6.0	41	22.4
1	0 32.9	12	6.6	42	23.0
2	1 5.7	13	7.1	43	23.5
3	1 38.6	14	7.7	44	24.1
		15	8.2	45	24.6
4	2 11.3	16	8.8	46	25.2
5	2 44.3	17	9.3	47	25.7
6	3 17.1	18	9.9	48	26.3
7	3 50.0	19	10.4	49	26.8
8	4 22.8	20	11.0	50	27.4
9	4 55.7	21	11.5	51	27.9
10	5 28.5	22	12.0	52	28.5
11	6 1.4	23	12.5	53	29.0
12	6 34.2	24	13.1	54	29.6
13	7 7.1	25	13.6	55	30.1
14	7 39.9	26	14.2	56	30.7
15	8 12.8	27	14.7	57	31.2
16	8 45.6	28	15.3	58	31.8
17	9 18.5	29	15.9	59	32.3
18	9 51.3	30	16.4	60	32.9
19	10 24.2			Seconds.	
20	10 57.0			10	0.1
21	11 29.9			20	0.2
22	12 2.7			30	0.3
23	12 35.6			40	0.4
24	13 8.4			50	0.5
				60	0.5

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 0' 0"	0.0000	0.3010	0.4771	0.6021	0.6990	0.7782	0.8451	0.9031	0.9542	
0 10	1.0000	1.0414	1.0792	1.1139	1.1461	1.1761	1.2041	1.2304	1.2553	1.2788
0 20	1.3010	1.3222	1.3424	1.3617	1.3802	1.3979	1.4150	1.4314	1.4472	1.4624
0 30	1.4771	1.4914	1.5051	1.5185	1.5315	1.5441	1.5563	1.5682	1.5798	1.5911
0 40	1.6021	1.6128	1.6232	1.6335	1.6435	1.6532	1.6628	1.6721	1.6812	1.6902
0 50	1.6990	1.7076	1.7160	1.7243	1.7324	1.7404	1.7482	1.7559	1.7634	1.7709
0 1 0	1.7782	1.7853	1.7924	1.7993	1.8062	1.8129	1.8195	1.8261	1.8325	1.8388
1 10	1.8451	1.8513	1.8573	1.8633	1.8692	1.8751	1.8808	1.8865	1.8921	1.8976
1 20	1.9031	1.9085	1.9138	1.9191	1.9243	1.9294	1.9345	1.9395	1.9445	1.9494
1 30	1.9542	1.9589	1.9638	1.9685	1.9731	1.9777	1.9823	1.9868	1.9912	1.9956
1 40	2.0000	2.0043	2.0086	2.0128	2.0170	2.0212	2.0253	2.0294	2.0334	2.0374
1 50	2.0414	2.0453	2.0492	2.0531	2.0569	2.0607	2.0645	2.0682	2.0719	2.0755
0 2 0	2.0792	2.0828	2.0864	2.0899	2.0934	2.0969	2.1004	2.1038	2.1072	2.1106
2 10	2.1139	2.1173	2.1206	2.1239	2.1271	2.1303	2.1335	2.1367	2.1399	2.1430
2 20	2.1461	2.1492	2.1523	2.1553	2.1584	2.1614	2.1644	2.1673	2.1703	2.1732
2 30	2.1761	2.1790	2.1818	2.1847	2.1875	2.1903	2.1931	2.1959	2.1987	2.2014
2 40	2.2041	2.2068	2.2095	2.2122	2.2148	2.2175	2.2201	2.2227	2.2253	2.2279
2 50	2.2304	2.2330	2.2355	2.2380	2.2405	2.2430	2.2455	2.2480	2.2504	2.2529
0 3 0	2.2553	2.2577	2.2601	2.2625	2.2648	2.2672	2.2695	2.2718	2.2742	2.2765
3 10	2.2788	2.2810	2.2833	2.2856	2.2878	2.2900	2.2923	2.2945	2.2967	2.2989
3 20	2.3010	2.3032	2.3054	2.3075	2.3096	2.3118	2.3139	2.3160	2.3181	2.3201
3 30	2.3222	2.3243	2.3263	2.3284	2.3304	2.3324	2.3345	2.3365	2.3385	2.3404
3 40	2.3424	2.3444	2.3464	2.3483	2.3502	2.3522	2.3541	2.3560	2.3579	2.3598
3 50	2.3617	2.3636	2.3655	2.3674	2.3692	2.3711	2.3729	2.3747	2.3766	2.3784
0 4 0	2.3802	2.3820	2.3838	2.3856	2.3874	2.3892	2.3909	2.3927	2.3945	2.3962
4 10	2.3979	2.3997	2.4014	2.4031	2.4048	2.4065	2.4082	2.4099	2.4116	2.4133
4 20	2.4150	2.4166	2.4183	2.4200	2.4216	2.4232	2.4249	2.4265	2.4281	2.4298
4 30	2.4314	2.4330	2.4346	2.4362	2.4378	2.4393	2.4409	2.4425	2.4440	2.4456
4 40	2.4472	2.4487	2.4502	2.4518	2.4533	2.4548	2.4564	2.4579	2.4594	2.4609
4 50	2.4624	2.4639	2.4654	2.4669	2.4683	2.4698	2.4713	2.4728	2.4742	2.4757
0 5 0	2.4771	2.4786	2.4800	2.4814	2.4829	2.4843	2.4857	2.4871	2.4886	2.4900
5 10	2.4914	2.4928	2.4942	2.4955	2.4969	2.4983	2.4997	2.5011	2.5024	2.5038
5 20	2.5051	2.5065	2.5079	2.5092	2.5105	2.5119	2.5132	2.5145	2.5159	2.5172
5 30	2.5185	2.5198	2.5211	2.5224	2.5237	2.5250	2.5263	2.5276	2.5289	2.5302
5 40	2.5315	2.5328	2.5340	2.5353	2.5366	2.5378	2.5391	2.5403	2.5416	2.5428
5 50	2.5441	2.5453	2.5465	2.5478	2.5490	2.5502	2.5514	2.5527	2.5539	2.5551
0 6 0	2.5563	2.5575	2.5587	2.5599	2.5611	2.5623	2.5635	2.5647	2.5658	2.5670
6 10	2.5682	2.5694	2.5705	2.5717	2.5729	2.5740	2.5752	2.5763	2.5775	2.5786
6 20	2.5798	2.5809	2.5821	2.5832	2.5843	2.5855	2.5866	2.5877	2.5888	2.5899
6 30	2.5911	2.5922	2.5933	2.5944	2.5955	2.5966	2.5977	2.5988	2.5999	2.6010
6 40	2.6021	2.6031	2.6042	2.6053	2.6064	2.6075	2.6085	2.6096	2.6107	2.6117
6 50	2.6128	2.6138	2.6149	2.6160	2.6170	2.6180	2.6191	2.6201	2.6212	2.6222
0 7 0	2.6232	2.6243	2.6253	2.6263	2.6274	2.6284	2.6294	2.6304	2.6314	2.6325
7 10	2.6335	2.6345	2.6355	2.6365	2.6375	2.6385	2.6395	2.6405	2.6415	2.6425
7 20	2.6435	2.6444	2.6454	2.6464	2.6474	2.6484	2.6493	2.6503	2.6513	2.6522
7 30	2.6532	2.6542	2.6551	2.6561	2.6571	2.6580	2.6590	2.6599	2.6609	2.6618
7 40	2.6628	2.6637	2.6646	2.6656	2.6665	2.6675	2.6684	2.6693	2.6702	2.6712
7 50	2.6721	2.6730	2.6739	2.6749	2.6758	2.6767	2.6776	2.6785	2.6794	2.6803
0 8 0	2.6812	2.6821	2.6830	2.6839	2.6848	2.6857	2.6866	2.6875	2.6884	2.6893
8 10	2.6902	2.6911	2.6920	2.6928	2.6937	2.6946	2.6955	2.6964	2.6972	2.6981
8 20	2.6990	2.6998	2.7007	2.7016	2.7024	2.7033	2.7042	2.7050	2.7059	2.7067
8 30	2.7076	2.7084	2.7093	2.7101	2.7110	2.7118	2.7126	2.7135	2.7143	2.7152
8 40	2.7160	2.7168	2.7177	2.7185	2.7193	2.7202	2.7210	2.7218	2.7226	2.7235
8 50	2.7243	2.7251	2.7259	2.7267	2.7275	2.7284	2.7292	2.7300	2.7308	2.7316
0 9 0	2.7324	2.7332	2.7340	2.7348	2.7356	2.7364	2.7372	2.7380	2.7388	2.7396
9 10	2.7404	2.7412	2.7419	2.7427	2.7435	2.7443	2.7451	2.7459	2.7466	2.7474
9 20	2.7482	2.7490	2.7497	2.7505	2.7513	2.7520	2.7528	2.7536	2.7543	2.7551
9 30	2.7559	2.7566	2.7574	2.7582	2.7589	2.7597	2.7604	2.7612	2.7619	2.7627
9 40	2.7634	2.7642	2.7649	2.7657	2.7664	2.7672	2.7679	2.7686	2.7694	2.7701
9 50	2.7709	2.7716	2.7723	2.7731	2.7738	2.7745	2.7752	2.7760	2.7767	2.7774

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 10' 0"	2.7782	2.7789	2.7796	2.7803	2.7810	2.7818	2.7825	2.7832	2.7839	2.7846
10 10	2.7853	2.7860	2.7868	2.7875	2.7882	2.7889	2.7896	2.7903	2.7910	2.7917
10 20	2.7924	2.7931	2.7938	2.7945	2.7952	2.7959	2.7966	2.7973	2.7980	2.7987
10 30	2.7993	2.8000	2.8007	2.8014	2.8021	2.8028	2.8035	2.8041	2.8048	2.8055
10 40	2.8062	2.8069	2.8075	2.8082	2.8089	2.8096	2.8102	2.8109	2.8116	2.8122
10 50	2.8129	2.8136	2.8142	2.8149	2.8156	2.8162	2.8169	2.8176	2.8182	2.8189
0 11 0	2.8195	2.8202	2.8209	2.8215	2.8222	2.8228	2.8235	2.8241	2.8248	2.8254
11 10	2.8261	2.8267	2.8274	2.8280	2.8287	2.8293	2.8299	2.8306	2.8312	2.8319
11 20	2.8325	2.8331	2.8338	2.8344	2.8351	2.8357	2.8363	2.8370	2.8376	2.8382
11 30	2.8388	2.8395	2.8401	2.8407	2.8414	2.8420	2.8426	2.8432	2.8439	2.8445
11 40	2.8451	2.8457	2.8463	2.8470	2.8476	2.8482	2.8488	2.8494	2.8500	2.8506
11 50	2.8513	2.8519	2.8525	2.8531	2.8537	2.8543	2.8549	2.8555	2.8561	2.8567
0 12 0	2.8573	2.8579	2.8585	2.8591	2.8597	2.8603	2.8609	2.8615	2.8621	2.8627
12 10	2.8633	2.8639	2.8645	2.8651	2.8657	2.8663	2.8669	2.8675	2.8681	2.8686
12 20	2.8692	2.8698	2.8704	2.8710	2.8716	2.8722	2.8727	2.8733	2.8739	2.8745
12 30	2.8751	2.8756	2.8762	2.8768	2.8774	2.8779	2.8785	2.8791	2.8797	2.8802
12 40	2.8808	2.8814	2.8820	2.8825	2.8831	2.8837	2.8842	2.8848	2.8854	2.8859
12 50	2.8865	2.8871	2.8876	2.8882	2.8887	2.8893	2.8899	2.8904	2.8910	2.8915
0 13 0	2.8921	2.8927	2.8932	2.8938	2.8943	2.8949	2.8954	2.8960	2.8965	2.8971
13 10	2.8976	2.8982	2.8987	2.8993	2.8998	2.9004	2.9009	2.9015	2.9020	2.9025
13 20	2.9031	2.9036	2.9042	2.9047	2.9053	2.9058	2.9063	2.9069	2.9074	2.9079
13 30	2.9085	2.9090	2.9096	2.9101	2.9106	2.9112	2.9117	2.9122	2.9128	2.9133
13 40	2.9138	2.9143	2.9149	2.9154	2.9159	2.9165	2.9170	2.9175	2.9180	2.9186
13 50	2.9191	2.9196	2.9201	2.9206	2.9212	2.9217	2.9222	2.9227	2.9232	2.9238
0 14 0	2.9243	2.9248	2.9253	2.9258	2.9263	2.9269	2.9274	2.9279	2.9284	2.9289
14 10	2.9294	2.9299	2.9304	2.9309	2.9315	2.9320	2.9325	2.9330	2.9335	2.9340
14 20	2.9345	2.9350	2.9355	2.9360	2.9365	2.9370	2.9375	2.9380	2.9385	2.9390
14 30	2.9395	2.9400	2.9405	2.9410	2.9415	2.9420	2.9425	2.9430	2.9435	2.9440
14 40	2.9445	2.9450	2.9455	2.9460	2.9465	2.9469	2.9474	2.9479	2.9484	2.9489
14 50	2.9494	2.9499	2.9504	2.9509	2.9513	2.9518	2.9523	2.9528	2.9533	2.9538
0 15 0	2.9542	2.9547	2.9552	2.9557	2.9562	2.9566	2.9571	2.9576	2.9581	2.9586
15 10	2.9590	2.9595	2.9600	2.9605	2.9609	2.9614	2.9619	2.9624	2.9628	2.9633
15 20	2.9638	2.9643	2.9647	2.9652	2.9657	2.9661	2.9666	2.9671	2.9675	2.9680
15 30	2.9685	2.9689	2.9694	2.9699	2.9703	2.9708	2.9713	2.9717	2.9722	2.9727
15 40	2.9731	2.9736	2.9741	2.9745	2.9750	2.9754	2.9759	2.9763	2.9768	2.9773
15 50	2.9777	2.9782	2.9786	2.9791	2.9795	2.9800	2.9805	2.9809	2.9814	2.9818
0 16 0	2.9823	2.9827	2.9832	2.9836	2.9841	2.9845	2.9850	2.9854	2.9859	2.9863
16 10	2.9868	2.9872	2.9877	2.9881	2.9886	2.9890	2.9894	2.9899	2.9903	2.9908
16 20	2.9912	2.9917	2.9921	2.9926	2.9930	2.9934	2.9939	2.9943	2.9948	2.9952
16 30	2.9956	2.9961	2.9965	2.9969	2.9974	2.9978	2.9983	2.9987	2.9991	2.9996
16 40	3.0000	3.0004	3.0009	3.0013	3.0017	3.0022	3.0026	3.0030	3.0035	3.0039
16 50	3.0043	3.0048	3.0052	3.0056	3.0060	3.0065	3.0069	3.0073	3.0077	3.0082
0 17 0	3.0086	3.0090	3.0095	3.0099	3.0103	3.0107	3.0111	3.0116	3.0120	3.0124
17 10	3.0128	3.0133	3.0137	3.0141	3.0145	3.0149	3.0154	3.0158	3.0162	3.0166
17 20	3.0170	3.0175	3.0179	3.0183	3.0187	3.0191	3.0195	3.0199	3.0204	3.0208
17 30	3.0212	3.0216	3.0220	3.0224	3.0228	3.0233	3.0237	3.0241	3.0245	3.0249
17 40	3.0253	3.0257	3.0261	3.0265	3.0269	3.0273	3.0278	3.0282	3.0286	3.0290
17 50	3.0294	3.0298	3.0302	3.0306	3.0310	3.0314	3.0318	3.0322	3.0326	3.0330
0 18 0	3.0334	3.0338	3.0342	3.0346	3.0350	3.0354	3.0358	3.0362	3.0366	3.0370
18 10	3.0374	3.0378	3.0382	3.0386	3.0390	3.0394	3.0398	3.0402	3.0406	3.0410
18 20	3.0414	3.0418	3.0422	3.0426	3.0430	3.0434	3.0438	3.0441	3.0445	3.0449
18 30	3.0453	3.0457	3.0461	3.0465	3.0469	3.0473	3.0477	3.0481	3.0484	3.0488
18 40	3.0492	3.0496	3.0500	3.0504	3.0508	3.0512	3.0515	3.0519	3.0523	3.0527
18 50	3.0531	3.0535	3.0538	3.0542	3.0546	3.0550	3.0554	3.0558	3.0561	3.0565
0 19 0	3.0569	3.0573	3.0577	3.0580	3.0584	3.0588	3.0592	3.0596	3.0599	3.0603
19 10	3.0607	3.0611	3.0615	3.0618	3.0622	3.0626	3.0630	3.0633	3.0637	3.0641
19 20	3.0645	3.0648	3.0652	3.0656	3.0660	3.0663	3.0667	3.0671	3.0674	3.0678
19 30	3.0682	3.0686	3.0689	3.0693	3.0697	3.0700	3.0704	3.0708	3.0711	3.0715
19 40	3.0719	3.0722	3.0726	3.0730	3.0734	3.0737	3.0741	3.0745	3.0748	3.0752
19 50	3.0755	3.0759	3.0763	3.0766	3.0770	3.0774	3.0777	3.0781	3.0785	3.0788

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 20' 0"	3.0792	3.0795	3.0799	3.0803	3.0806	3.0810	3.0813	3.0817	3.0821	3.0824
20 10	3.0828	3.0831	3.0835	3.0839	3.0842	3.0846	3.0849	3.0853	3.0856	3.0860
20 20	3.0864	3.0867	3.0871	3.0874	3.0878	3.0881	3.0885	3.0888	3.0892	3.0896
20 30	3.0899	3.0903	3.0906	3.0910	3.0913	3.0917	3.0920	3.0924	3.0927	3.0931
20 40	3.0934	3.0938	3.0941	3.0945	3.0948	3.0952	3.0955	3.0959	3.0962	3.0966
20 50	3.0969	3.0973	3.0976	3.0980	3.0983	3.0986	3.0990	3.0993	3.0997	3.1000
0 21 0	3.1004	3.1007	3.1011	3.1014	3.1017	3.1021	3.1024	3.1028	3.1031	3.1035
21 10	3.1038	3.1041	3.1045	3.1048	3.1052	3.1055	3.1059	3.1062	3.1065	3.1069
21 20	3.1072	3.1075	3.1079	3.1082	3.1086	3.1089	3.1092	3.1096	3.1099	3.1103
21 30	3.1106	3.1109	3.1113	3.1116	3.1119	3.1123	3.1126	3.1129	3.1133	3.1136
21 40	3.1139	3.1143	3.1146	3.1149	3.1153	3.1156	3.1159	3.1163	3.1166	3.1169
21 50	3.1173	3.1176	3.1179	3.1183	3.1186	3.1189	3.1193	3.1196	3.1199	3.1202
0 22 0	3.1206	3.1209	3.1212	3.1216	3.1219	3.1222	3.1225	3.1229	3.1232	3.1235
22 10	3.1239	3.1242	3.1245	3.1248	3.1252	3.1255	3.1258	3.1261	3.1265	3.1268
22 20	3.1271	3.1274	3.1278	3.1281	3.1284	3.1287	3.1290	3.1294	3.1297	3.1300
22 30	3.1303	3.1307	3.1310	3.1313	3.1316	3.1319	3.1323	3.1326	3.1329	3.1332
22 40	3.1335	3.1339	3.1342	3.1345	3.1348	3.1351	3.1355	3.1358	3.1361	3.1364
22 50	3.1367	3.1370	3.1374	3.1377	3.1380	3.1383	3.1386	3.1389	3.1392	3.1396
0 23 0	3.1399	3.1402	3.1405	3.1408	3.1411	3.1414	3.1418	3.1421	3.1424	3.1427
23 10	3.1430	3.1433	3.1436	3.1440	3.1443	3.1446	3.1449	3.1452	3.1455	3.1458
23 20	3.1461	3.1464	3.1467	3.1471	3.1474	3.1477	3.1480	3.1483	3.1486	3.1489
23 30	3.1492	3.1495	3.1498	3.1501	3.1504	3.1508	3.1511	3.1514	3.1517	3.1520
23 40	3.1523	3.1526	3.1529	3.1532	3.1535	3.1538	3.1541	3.1544	3.1547	3.1550
23 50	3.1553	3.1556	3.1559	3.1562	3.1565	3.1569	3.1572	3.1575	3.1578	3.1581
0 24 0	3.1584	3.1587	3.1590	3.1593	3.1596	3.1599	3.1602	3.1605	3.1608	3.1611
24 10	3.1614	3.1617	3.1620	3.1623	3.1626	3.1629	3.1632	3.1635	3.1638	3.1641
24 20	3.1644	3.1647	3.1649	3.1652	3.1655	3.1658	3.1661	3.1664	3.1667	3.1670
24 30	3.1673	3.1676	3.1679	3.1682	3.1685	3.1688	3.1691	3.1694	3.1697	3.1700
24 40	3.1703	3.1706	3.1708	3.1711	3.1714	3.1717	3.1720	3.1723	3.1726	3.1729
24 50	3.1732	3.1735	3.1738	3.1741	3.1744	3.1746	3.1749	3.1752	3.1755	3.1758
0 25 0	3.1761	3.1764	3.1767	3.1770	3.1772	3.1775	3.1778	3.1781	3.1784	3.1787
25 10	3.1790	3.1793	3.1796	3.1798	3.1801	3.1804	3.1807	3.1810	3.1813	3.1816
25 20	3.1818	3.1821	3.1824	3.1827	3.1830	3.1833	3.1836	3.1838	3.1841	3.1844
25 30	3.1847	3.1850	3.1853	3.1855	3.1858	3.1861	3.1864	3.1867	3.1870	3.1872
25 40	3.1875	3.1878	3.1881	3.1884	3.1886	3.1889	3.1892	3.1895	3.1898	3.1901
25 50	3.1903	3.1906	3.1909	3.1912	3.1915	3.1917	3.1920	3.1923	3.1926	3.1928
0 26 0	3.1931	3.1934	3.1937	3.1940	3.1942	3.1945	3.1948	3.1951	3.1953	3.1956
26 10	3.1959	3.1962	3.1965	3.1967	3.1970	3.1973	3.1976	3.1978	3.1981	3.1984
26 20	3.1987	3.1989	3.1992	3.1995	3.1998	3.2000	3.2003	3.2006	3.2009	3.2011
26 30	3.2014	3.2017	3.2019	3.2022	3.2025	3.2028	3.2030	3.2033	3.2036	3.2038
26 40	3.2041	3.2044	3.2047	3.2049	3.2052	3.2055	3.2057	3.2060	3.2063	3.2066
26 50	3.2068	3.2071	3.2074	3.2076	3.2079	3.2082	3.2084	3.2087	3.2090	3.2092
0 27 0	3.2095	3.2098	3.2101	3.2103	3.2106	3.2109	3.2111	3.2114	3.2117	3.2119
27 10	3.2122	3.2125	3.2127	3.2130	3.2133	3.2135	3.2138	3.2140	3.2143	3.2146
27 20	3.2148	3.2151	3.2154	3.2156	3.2159	3.2162	3.2164	3.2167	3.2170	3.2172
27 30	3.2175	3.2177	3.2180	3.2183	3.2185	3.2188	3.2191	3.2193	3.2196	3.2198
27 40	3.2201	3.2204	3.2206	3.2209	3.2212	3.2214	3.2217	3.2219	3.2222	3.2225
27 50	3.2227	3.2230	3.2232	3.2235	3.2238	3.2240	3.2243	3.2245	3.2248	3.2250
0 28 0	3.2253	3.2256	3.2258	3.2261	3.2263	3.2266	3.2269	3.2271	3.2274	3.2276
28 10	3.2279	3.2281	3.2284	3.2287	3.2289	3.2292	3.2294	3.2297	3.2299	3.2302
28 20	3.2304	3.2307	3.2310	3.2312	3.2315	3.2317	3.2320	3.2322	3.2325	3.2327
28 30	3.2330	3.2333	3.2335	3.2338	3.2340	3.2343	3.2345	3.2348	3.2350	3.2353
28 40	3.2355	3.2358	3.2360	3.2363	3.2365	3.2368	3.2370	3.2373	3.2375	3.2378
28 50	3.2380	3.2383	3.2385	3.2388	3.2390	3.2393	3.2395	3.2398	3.2400	3.2403
0 29 0	3.2405	3.2408	3.2410	3.2413	3.2415	3.2418	3.2420	3.2423	3.2425	3.2428
29 10	3.2430	3.2433	3.2435	3.2438	3.2440	3.2443	3.2445	3.2448	3.2450	3.2453
29 20	3.2455	3.2458	3.2460	3.2463	3.2465	3.2467	3.2470	3.2472	3.2475	3.2477
29 30	3.2480	3.2482	3.2485	3.2487	3.2490	3.2492	3.2494	3.2497	3.2499	3.2502
29 40	3.2504	3.2507	3.2509	3.2512	3.2514	3.2516	3.2519	3.2521	3.2524	3.2526
29 50	3.2529	3.2531	3.2533	3.2536	3.2538	3.2541	3.2543	3.2545	3.2548	3.2550

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 30' 0"	3.2553	3.2555	3.2558	3.2560	3.2562	3.2565	3.2567	3.2570	3.2572	3.2574
30 10	3.2577	3.2579	3.2582	3.2584	3.2586	3.2589	3.2591	3.2594	3.2596	3.2598
30 20	3.2601	3.2603	3.2605	3.2608	3.2610	3.2613	3.2615	3.2617	3.2620	3.2622
30 30	3.2625	3.2627	3.2629	3.2632	3.2634	3.2636	3.2639	3.2641	3.2643	3.2646
30 40	3.2648	3.2651	3.2653	3.2655	3.2658	3.2660	3.2662	3.2665	3.2667	3.2669
30 50	3.2672	3.2674	3.2676	3.2679	3.2681	3.2683	3.2686	3.2688	3.2690	3.2693
0 31 0	3.2695	3.2697	3.2700	3.2702	3.2704	3.2707	3.2709	3.2711	3.2714	3.2716
31 10	3.2718	3.2721	3.2723	3.2725	3.2728	3.2730	3.2732	3.2735	3.2737	3.2739
31 20	3.2742	3.2744	3.2746	3.2749	3.2751	3.2753	3.2755	3.2758	3.2760	3.2762
31 30	3.2765	3.2767	3.2769	3.2772	3.2774	3.2776	3.2778	3.2781	3.2783	3.2785
31 40	3.2788	3.2790	3.2792	3.2794	3.2797	3.2799	3.2801	3.2804	3.2806	3.2808
31 50	3.2810	3.2813	3.2815	3.2817	3.2819	3.2822	3.2824	3.2826	3.2828	3.2831
0 32 0	3.2833	3.2835	3.2838	3.2840	3.2842	3.2844	3.2847	3.2849	3.2851	3.2853
32 10	3.2856	3.2858	3.2860	3.2862	3.2865	3.2867	3.2869	3.2871	3.2874	3.2876
32 20	3.2878	3.2880	3.2882	3.2885	3.2887	3.2889	3.2891	3.2894	3.2896	3.2898
32 30	3.2900	3.2903	3.2905	3.2907	3.2909	3.2911	3.2914	3.2916	3.2918	3.2920
32 40	3.2923	3.2925	3.2927	3.2929	3.2931	3.2934	3.2936	3.2938	3.2940	3.2942
32 50	3.2945	3.2947	3.2949	3.2951	3.2953	3.2956	3.2958	3.2960	3.2962	3.2964
0 33 0	3.2967	3.2969	3.2971	3.2973	3.2975	3.2978	3.2980	3.2982	3.2984	3.2986
33 10	3.2989	3.2991	3.2993	3.2995	3.2997	3.2999	3.3002	3.3004	3.3006	3.3008
33 20	3.3010	3.3012	3.3015	3.3017	3.3019	3.3021	3.3023	3.3025	3.3028	3.3030
33 30	3.3032	3.3034	3.3036	3.3038	3.3041	3.3043	3.3045	3.3047	3.3049	3.3051
33 40	3.3054	3.3056	3.3058	3.3060	3.3062	3.3064	3.3066	3.3069	3.3071	3.3073
33 50	3.3075	3.3077	3.3079	3.3081	3.3084	3.3086	3.3088	3.3090	3.3092	3.3094
0 34 0	3.3096	3.3098	3.3101	3.3103	3.3105	3.3107	3.3109	3.3111	3.3113	3.3115
34 10	3.3118	3.3120	3.3122	3.3124	3.3126	3.3128	3.3130	3.3132	3.3134	3.3137
34 20	3.3139	3.3141	3.3143	3.3145	3.3147	3.3149	3.3151	3.3153	3.3156	3.3158
34 30	3.3160	3.3162	3.3164	3.3166	3.3168	3.3170	3.3172	3.3174	3.3176	3.3179
34 40	3.3181	3.3183	3.3185	3.3187	3.3189	3.3191	3.3193	3.3195	3.3197	3.3199
34 50	3.3201	3.3204	3.3206	3.3208	3.3210	3.3212	3.3214	3.3216	3.3218	3.3220
0 35 0	3.3222	3.3224	3.3226	3.3228	3.3230	3.3233	3.3235	3.3237	3.3239	3.3241
35 10	3.3243	3.3245	3.3247	3.3249	3.3251	3.3253	3.3255	3.3257	3.3259	3.3261
35 20	3.3263	3.3265	3.3267	3.3269	3.3272	3.3274	3.3276	3.3278	3.3280	3.3282
35 30	3.3284	3.3286	3.3288	3.3290	3.3292	3.3294	3.3296	3.3298	3.3300	3.3302
35 40	3.3304	3.3306	3.3308	3.3310	3.3312	3.3314	3.3316	3.3318	3.3320	3.3322
35 50	3.3324	3.3326	3.3328	3.3330	3.3332	3.3334	3.3336	3.3339	3.3341	3.3343
0 36 0	3.3345	3.3347	3.3349	3.3351	3.3353	3.3355	3.3357	3.3359	3.3361	3.3363
36 10	3.3365	3.3367	3.3369	3.3371	3.3373	3.3375	3.3377	3.3379	3.3381	3.3383
36 20	3.3385	3.3387	3.3389	3.3391	3.3393	3.3395	3.3397	3.3398	3.3400	3.3402
36 30	3.3404	3.3406	3.3408	3.3410	3.3412	3.3414	3.3416	3.3418	3.3420	3.3422
36 40	3.3424	3.3426	3.3428	3.3430	3.3432	3.3434	3.3436	3.3438	3.3440	3.3442
36 50	3.3444	3.3446	3.3448	3.3450	3.3452	3.3454	3.3456	3.3458	3.3460	3.3462
0 37 0	3.3464	3.3465	3.3467	3.3469	3.3471	3.3473	3.3475	3.3477	3.3479	3.3481
37 10	3.3483	3.3485	3.3487	3.3489	3.3491	3.3493	3.3495	3.3497	3.3499	3.3501
37 20	3.3502	3.3504	3.3506	3.3508	3.3510	3.3512	3.3514	3.3516	3.3518	3.3520
37 30	3.3522	3.3524	3.3526	3.3528	3.3530	3.3531	3.3533	3.3535	3.3537	3.3539
37 40	3.3541	3.3543	3.3545	3.3547	3.3549	3.3551	3.3553	3.3555	3.3556	3.3558
37 50	3.3560	3.3562	3.3564	3.3566	3.3568	3.3570	3.3572	3.3574	3.3576	3.3577
0 38 0	3.3579	3.3581	3.3583	3.3585	3.3587	3.3589	3.3591	3.3593	3.3595	3.3596
38 10	3.3598	3.3600	3.3602	3.3604	3.3606	3.3608	3.3610	3.3612	3.3614	3.3615
38 20	3.3617	3.3619	3.3621	3.3623	3.3625	3.3627	3.3629	3.3630	3.3632	3.3634
38 30	3.3636	3.3638	3.3640	3.3642	3.3644	3.3646	3.3647	3.3649	3.3651	3.3653
38 40	3.3655	3.3657	3.3659	3.3660	3.3662	3.3664	3.3666	3.3668	3.3670	3.3672
38 50	3.3674	3.3675	3.3677	3.3679	3.3681	3.3683	3.3685	3.3687	3.3688	3.3690
0 39 0	3.3692	3.3694	3.3696	3.3698	3.3700	3.3701	3.3703	3.3705	3.3707	3.3709
39 10	3.3711	3.3713	3.3714	3.3716	3.3718	3.3720	3.3722	3.3724	3.3725	3.3727
39 20	3.3729	3.3731	3.3733	3.3735	3.3736	3.3738	3.3740	3.3742	3.3744	3.3746
39 30	3.3747	3.3749	3.3751	3.3753	3.3755	3.3757	3.3758	3.3760	3.3762	3.3764
39 40	3.3766	3.3768	3.3769	3.3771	3.3773	3.3775	3.3777	3.3779	3.3780	3.3782
39 50	3.3784	3.3786	3.3788	3.3789	3.3791	3.3793	3.3795	3.3797	3.3798	3.3800

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 40' 0"	3.3802	3.3804	3.3806	3.3808	3.3809	3.3811	3.3813	3.3815	3.3817	3.3818
40 10	3.3820	3.3822	3.3824	3.3826	3.3827	3.3829	3.3831	3.3833	3.3835	3.3836
40 20	3.3838	3.3840	3.3842	3.3844	3.3845	3.3847	3.3849	3.3851	3.3852	3.3854
40 30	3.3856	3.3858	3.3860	3.3861	3.3863	3.3865	3.3867	3.3869	3.3870	3.3872
40 40	3.3874	3.3876	3.3877	3.3879	3.3881	3.3883	3.3885	3.3886	3.3888	3.3890
40 50	3.3892	3.3893	3.3895	3.3897	3.3899	3.3901	3.3902	3.3904	3.3906	3.3908
41 0	3.3909	3.3911	3.3913	3.3915	3.3916	3.3918	3.3920	3.3922	3.3923	3.3925
41 10	3.3927	3.3929	3.3930	3.3932	3.3934	3.3936	3.3938	3.3939	3.3941	3.3943
41 20	3.3945	3.3946	3.3948	3.3950	3.3952	3.3953	3.3955	3.3957	3.3959	3.3960
41 30	3.3962	3.3964	3.3965	3.3967	3.3969	3.3971	3.3972	3.3974	3.3976	3.3978
41 40	3.3979	3.3981	3.3983	3.3985	3.3986	3.3988	3.3990	3.3992	3.3993	3.3995
41 50	3.3997	3.3998	3.4000	3.4002	3.4004	3.4005	3.4007	3.4009	3.4011	3.4012
0 42 0	3.4014	3.4016	3.4017	3.4019	3.4021	3.4023	3.4024	3.4026	3.4028	3.4029
42 10	3.4031	3.4033	3.4035	3.4036	3.4038	3.4040	3.4041	3.4043	3.4045	3.4047
42 20	3.4048	3.4050	3.4052	3.4053	3.4055	3.4057	3.4059	3.4060	3.4062	3.4064
42 30	3.4065	3.4067	3.4069	3.4071	3.4072	3.4074	3.4076	3.4077	3.4079	3.4081
42 40	3.4082	3.4084	3.4086	3.4087	3.4089	3.4091	3.4093	3.4094	3.4096	3.4098
42 50	3.4099	3.4101	3.4103	3.4104	3.4106	3.4108	3.4109	3.4111	3.4113	3.4115
0 43 0	3.4116	3.4118	3.4120	3.4121	3.4123	3.4125	3.4126	3.4128	3.4130	3.4131
43 10	3.4133	3.4135	3.4136	3.4138	3.4140	3.4141	3.4143	3.4145	3.4146	3.4148
43 20	3.4150	3.4151	3.4153	3.4155	3.4156	3.4158	3.4160	3.4161	3.4163	3.4165
43 30	3.4166	3.4168	3.4170	3.4171	3.4173	3.4175	3.4176	3.4178	3.4180	3.4181
43 40	3.4183	3.4185	3.4186	3.4188	3.4190	3.4191	3.4193	3.4195	3.4196	3.4198
43 50	3.4200	3.4201	3.4203	3.4205	3.4206	3.4208	3.4209	3.4211	3.4213	3.4214
0 44 0	3.4216	3.4218	3.4219	3.4221	3.4223	3.4224	3.4226	3.4228	3.4229	3.4231
44 10	3.4232	3.4234	3.4236	3.4237	3.4239	3.4241	3.4242	3.4244	3.4246	3.4247
44 20	3.4249	3.4250	3.4252	3.4254	3.4255	3.4257	3.4259	3.4260	3.4262	3.4263
44 30	3.4265	3.4267	3.4268	3.4270	3.4272	3.4273	3.4275	3.4276	3.4278	3.4280
44 40	3.4281	3.4283	3.4285	3.4286	3.4288	3.4289	3.4291	3.4293	3.4294	3.4296
44 50	3.4298	3.4299	3.4301	3.4302	3.4304	3.4306	3.4307	3.4309	3.4310	3.4312
0 45 0	3.4314	3.4315	3.4317	3.4318	3.4320	3.4322	3.4323	3.4325	3.4326	3.4328
45 10	3.4330	3.4331	3.4333	3.4334	3.4336	3.4338	3.4339	3.4341	3.4342	3.4344
45 20	3.4346	3.4347	3.4349	3.4350	3.4352	3.4354	3.4355	3.4357	3.4358	3.4360
45 30	3.4362	3.4363	3.4365	3.4366	3.4368	3.4370	3.4371	3.4373	3.4374	3.4376
45 40	3.4378	3.4379	3.4381	3.4382	3.4384	3.4385	3.4387	3.4389	3.4390	3.4392
45 50	3.4393	3.4395	3.4396	3.4398	3.4400	3.4401	3.4403	3.4404	3.4406	3.4408
0 46 0	3.4409	3.4411	3.4412	3.4414	3.4415	3.4417	3.4419	3.4420	3.4422	3.4423
46 10	3.4425	3.4426	3.4428	3.4429	3.4431	3.4433	3.4434	3.4436	3.4437	3.4439
46 20	3.4440	3.4442	3.4444	3.4445	3.4447	3.4448	3.4450	3.4451	3.4453	3.4454
46 30	3.4456	3.4458	3.4459	3.4461	3.4462	3.4464	3.4465	3.4467	3.4468	3.4470
46 40	3.4472	3.4473	3.4475	3.4476	3.4478	3.4479	3.4481	3.4482	3.4484	3.4486
46 50	3.4487	3.4489	3.4490	3.4492	3.4493	3.4495	3.4496	3.4498	3.4499	3.4501
0 47 0	3.4502	3.4504	3.4506	3.4507	3.4509	3.4510	3.4512	3.4513	3.4515	3.4516
47 10	3.4518	3.4519	3.4521	3.4522	3.4524	3.4526	3.4527	3.4529	3.4530	3.4532
47 20	3.4533	3.4535	3.4536	3.4538	3.4539	3.4541	3.4542	3.4544	3.4545	3.4547
47 30	3.4548	3.4550	3.4551	3.4553	3.4555	3.4556	3.4558	3.4559	3.4561	3.4562
47 40	3.4564	3.4565	3.4567	3.4568	3.4570	3.4571	3.4573	3.4574	3.4576	3.4577
47 50	3.4579	3.4580	3.4582	3.4583	3.4585	3.4586	3.4588	3.4589	3.4591	3.4592
0 48 0	3.4594	3.4595	3.4597	3.4598	3.4600	3.4601	3.4603	3.4604	3.4606	3.4607
48 10	3.4609	3.4610	3.4612	3.4613	3.4615	3.4616	3.4618	3.4619	3.4621	3.4622
48 20	3.4624	3.4625	3.4627	3.4628	3.4630	3.4631	3.4633	3.4634	3.4636	3.4637
48 30	3.4639	3.4640	3.4642	3.4643	3.4645	3.4646	3.4648	3.4649	3.4651	3.4652
48 40	3.4654	3.4655	3.4657	3.4658	3.4660	3.4661	3.4663	3.4664	3.4666	3.4667
48 50	3.4669	3.4670	3.4672	3.4673	3.4675	3.4676	3.4678	3.4679	3.4681	3.4682
0 49 0	3.4683	3.4685	3.4686	3.4688	3.4689	3.4691	3.4692	3.4694	3.4695	3.4697
49 10	3.4698	3.4700	3.4701	3.4703	3.4704	3.4706	3.4707	3.4709	3.4710	3.4711
49 20	3.4713	3.4714	3.4716	3.4717	3.4719	3.4720	3.4722	3.4723	3.4725	3.4726
49 30	3.4728	3.4729	3.4730	3.4732	3.4733	3.4735	3.4736	3.4738	3.4739	3.4741
49 40	3.4742	3.4744	3.4745	3.4747	3.4748	3.4751	3.4752	3.4753	3.4754	3.4755
49 50	3.4757	3.4758	3.4760	3.4761	3.4763	3.4764	3.4765	3.4767	3.4768	3.4770

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0 ^h .50 ^m .0 ^s	3.4771	3.4773	3.4774	3.4776	3.4777	3.4778	3.4780	3.4781	3.4783	3.4784
50 10	3.4786	3.4787	3.4789	3.4790	3.4791	3.4793	3.4794	3.4796	3.4797	3.4799
50 20	3.4800	3.4802	3.4803	3.4804	3.4806	3.4807	3.4809	3.4810	3.4812	3.4813
50 30	3.4814	3.4816	3.4817	3.4819	3.4820	3.4822	3.4823	3.4824	3.4826	3.4827
50 40	3.4829	3.4830	3.4832	3.4833	3.4834	3.4836	3.4837	3.4839	3.4840	3.4842
50 50	3.4843	3.4844	3.4846	3.4847	3.4849	3.4850	3.4852	3.4853	3.4854	3.4856
0 51 0	3.4857	3.4859	3.4860	3.4861	3.4863	3.4864	3.4866	3.4867	3.4869	3.4870
51 10	3.4871	3.4873	3.4874	3.4876	3.4877	3.4878	3.4880	3.4881	3.4883	3.4884
51 20	3.4886	3.4887	3.4888	3.4890	3.4891	3.4893	3.4894	3.4895	3.4897	3.4898
51 30	3.4900	3.4901	3.4902	3.4904	3.4905	3.4907	3.4908	3.4909	3.4911	3.4912
51 40	3.4914	3.4915	3.4916	3.4918	3.4919	3.4921	3.4922	3.4923	3.4925	3.4926
51 50	3.4928	3.4929	3.4930	3.4932	3.4933	3.4935	3.4936	3.4937	3.4939	3.4940
0 52 0	3.4942	3.4943	3.4944	3.4946	3.4947	3.4949	3.4950	3.4951	3.4953	3.4954
52 10	3.4955	3.4957	3.4958	3.4960	3.4961	3.4962	3.4964	3.4965	3.4967	3.4968
52 20	3.4969	3.4971	3.4972	3.4973	3.4975	3.4976	3.4978	3.4979	3.4980	3.4982
52 30	3.4983	3.4984	3.4986	3.4987	3.4989	3.4990	3.4991	3.4993	3.4994	3.4995
52 40	3.4997	3.4998	3.5000	3.5001	3.5002	3.5004	3.5005	3.5006	3.5008	3.5009
52 50	3.5011	3.5012	3.5013	3.5015	3.5016	3.5017	3.5019	3.5020	3.5022	3.5023
0 53 0	3.5024	3.5026	3.5027	3.5028	3.5030	3.5031	3.5032	3.5034	3.5035	3.5037
53 10	3.5038	3.5039	3.5041	3.5042	3.5043	3.5045	3.5046	3.5047	3.5049	3.5050
53 20	3.5051	3.5053	3.5054	3.5056	3.5057	3.5058	3.5060	3.5061	3.5062	3.5064
53 30	3.5065	3.5066	3.5068	3.5069	3.5070	3.5072	3.5073	3.5075	3.5076	3.5077
53 40	3.5079	3.5080	3.5081	3.5083	3.5084	3.5085	3.5087	3.5088	3.5089	3.5091
53 50	3.5092	3.5093	3.5095	3.5096	3.5097	3.5099	3.5100	3.5101	3.5103	3.5104
0 54 0	3.5105	3.5107	3.5108	3.5109	3.5111	3.5112	3.5113	3.5115	3.5116	3.5117
54 10	3.5119	3.5120	3.5122	3.5123	3.5124	3.5126	3.5127	3.5128	3.5130	3.5131
54 20	3.5132	3.5134	3.5135	3.5136	3.5138	3.5139	3.5140	3.5141	3.5143	3.5144
54 30	3.5145	3.5147	3.5148	3.5149	3.5151	3.5152	3.5153	3.5155	3.5156	3.5157
54 40	3.5159	3.5160	3.5161	3.5163	3.5164	3.5165	3.5167	3.5168	3.5169	3.5171
54 50	3.5172	3.5173	3.5175	3.5176	3.5177	3.5179	3.5180	3.5181	3.5183	3.5184
0 55 0	3.5185	3.5186	3.5188	3.5189	3.5190	3.5192	3.5193	3.5194	3.5196	3.5197
55 10	3.5198	3.5200	3.5201	3.5202	3.5204	3.5205	3.5206	3.5207	3.5209	3.5210
55 20	3.5211	3.5213	3.5214	3.5215	3.5217	3.5218	3.5219	3.5221	3.5222	3.5223
55 30	3.5224	3.5226	3.5227	3.5228	3.5230	3.5231	3.5232	3.5234	3.5235	3.5236
55 40	3.5237	3.5239	3.5240	3.5241	3.5243	3.5244	3.5245	3.5247	3.5248	3.5249
55 50	3.5250	3.5252	3.5253	3.5254	3.5256	3.5257	3.5258	3.5260	3.5261	3.5262
0 56 0	3.5263	3.5265	3.5266	3.5267	3.5269	3.5270	3.5271	3.5272	3.5274	3.5275
56 10	3.5276	3.5278	3.5279	3.5280	3.5281	3.5283	3.5284	3.5285	3.5287	3.5288
56 20	3.5289	3.5290	3.5292	3.5293	3.5294	3.5296	3.5297	3.5298	3.5299	3.5301
56 30	3.5302	3.5303	3.5305	3.5306	3.5307	3.5308	3.5310	3.5311	3.5312	3.5314
56 40	3.5315	3.5316	3.5317	3.5319	3.5320	3.5321	3.5322	3.5324	3.5325	3.5326
56 50	3.5328	3.5329	3.5330	3.5331	3.5333	3.5334	3.5335	3.5336	3.5338	3.5339
0 57 0	3.5340	3.5342	3.5343	3.5344	3.5345	3.5347	3.5348	3.5349	3.5350	3.5352
57 10	3.5353	3.5354	3.5355	3.5357	3.5358	3.5359	3.5361	3.5362	3.5363	3.5364
57 20	3.5366	3.5367	3.5368	3.5369	3.5371	3.5372	3.5373	3.5374	3.5376	3.5377
57 30	3.5378	3.5379	3.5381	3.5382	3.5383	3.5384	3.5386	3.5387	3.5388	3.5390
57 40	3.5391	3.5392	3.5393	3.5395	3.5396	3.5397	3.5398	3.5400	3.5401	3.5402
57 50	3.5403	3.5405	3.5406	3.5407	3.5408	3.5410	3.5411	3.5412	3.5413	3.5415
0 58 0	3.5416	3.5417	3.5418	3.5420	3.5421	3.5422	3.5423	3.5425	3.5426	3.5427
58 10	3.5428	3.5429	3.5431	3.5432	3.5433	3.5434	3.5436	3.5437	3.5438	3.5439
58 20	3.5441	3.5442	3.5443	3.5444	3.5446	3.5447	3.5448	3.5449	3.5451	3.5452
58 30	3.5453	3.5454	3.5456	3.5457	3.5458	3.5459	3.5460	3.5462	3.5463	3.5464
58 40	3.5465	3.5467	3.5468	3.5469	3.5470	3.5472	3.5473	3.5474	3.5475	3.5477
58 50	3.5478	3.5479	3.5480	3.5481	3.5483	3.5484	3.5485	3.5486	3.5488	3.5489
0 59 0	3.5490	3.5491	3.5492	3.5494	3.5495	3.5496	3.5497	3.5499	3.5500	3.5501
59 10	3.5502	3.5504	3.5505	3.5506	3.5507	3.5508	3.5510	3.5511	3.5512	3.5513
59 20	3.5514	3.5516	3.5517	3.5518	3.5519	3.5521	3.5522	3.5523	3.5524	3.5525
59 30	3.5527	3.5528	3.5529	3.5530	3.5532	3.5533	3.5534	3.5535	3.5536	3.5538
59 40	3.5539	3.5540	3.5541	3.5542	3.5544	3.5545	3.5546	3.5547	3.5549	3.5550
59 50	3.5551	3.5552	3.5553	3.5555	3.5556	3.5557	3.5558	3.5559	3.5561	3.5562

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.											
Arc.	0	1	2	3	4	5	6	7	8	9	
1 ^h 0 ^m 0 ^s	3.5563	3.5564	3.5565	3.5567	3.5568	3.5569	3.5570	3.5571	3.5573	3.5574	
0 10	3.5575	3.5576	3.5577	3.5579	3.5580	3.5581	3.5582	3.5583	3.5585	3.5586	
0 20	3.5587	3.5588	3.5589	3.5591	3.5592	3.5593	3.5594	3.5595	3.5597	3.5598	
0 30	3.5599	3.5600	3.5601	3.5603	3.5604	3.5605	3.5606	3.5607	3.5609	3.5610	
0 40	3.5611	3.5612	3.5613	3.5615	3.5616	3.5617	3.5618	3.5619	3.5621	3.5622	
0 50	3.5623	3.5624	3.5625	3.5626	3.5628	3.5629	3.5630	3.5631	3.5632	3.5634	
1 1 0	3.5635	3.5636	3.5637	3.5638	3.5640	3.5641	3.5642	3.5643	3.5644	3.5645	
1 1 10	3.5647	3.5648	3.5649	3.5650	3.5651	3.5653	3.5654	3.5655	3.5656	3.5657	
1 1 20	3.5658	3.5660	3.5661	3.5662	3.5663	3.5664	3.5666	3.5667	3.5668	3.5669	
1 1 30	3.5670	3.5671	3.5673	3.5674	3.5675	3.5676	3.5677	3.5678	3.5680	3.5681	
1 1 40	3.5682	3.5683	3.5684	3.5686	3.5687	3.5688	3.5689	3.5690	3.5691	3.5693	
1 1 50	3.5694	3.5695	3.5696	3.5697	3.5698	3.5700	3.5701	3.5702	3.5703	3.5704	
1 2 0	3.5705	3.5707	3.5708	3.5709	3.5710	3.5711	3.5712	3.5714	3.5715	3.5716	
2 10	3.5717	3.5718	3.5719	3.5721	3.5722	3.5723	3.5724	3.5725	3.5726	3.5728	
2 20	3.5729	3.5730	3.5731	3.5732	3.5733	3.5735	3.5736	3.5737	3.5738	3.5739	
2 30	3.5740	3.5741	3.5742	3.5744	3.5745	3.5746	3.5747	3.5748	3.5750	3.5751	
2 40	3.5752	3.5753	3.5754	3.5755	3.5756	3.5758	3.5759	3.5760	3.5761	3.5762	
2 50	3.5763	3.5765	3.5766	3.5767	3.5768	3.5769	3.5770	3.5771	3.5773	3.5774	
1 3 0	3.5775	3.5776	3.5777	3.5778	3.5780	3.5781	3.5782	3.5783	3.5784	3.5785	
3 10	3.5786	3.5788	3.5789	3.5790	3.5791	3.5792	3.5793	3.5794	3.5796	3.5797	
3 20	3.5798	3.5799	3.5800	3.5801	3.5802	3.5804	3.5805	3.5806	3.5807	3.5808	
3 30	3.5809	3.5810	3.5812	3.5813	3.5814	3.5815	3.5816	3.5817	3.5818	3.5819	
3 40	3.5821	3.5822	3.5823	3.5824	3.5825	3.5826	3.5827	3.5829	3.5830	3.5831	
3 50	3.5832	3.5833	3.5834	3.5835	3.5837	3.5838	3.5839	3.5840	3.5841	3.5842	
1 4 0	3.5843	3.5844	3.5846	3.5847	3.5848	3.5849	3.5850	3.5851	3.5852	3.5853	
4 10	3.5855	3.5856	3.5857	3.5858	3.5859	3.5860	3.5861	3.5862	3.5864	3.5865	
4 20	3.5866	3.5867	3.5868	3.5869	3.5870	3.5871	3.5873	3.5874	3.5875	3.5876	
4 30	3.5877	3.5878	3.5879	3.5880	3.5882	3.5883	3.5884	3.5885	3.5886	3.5887	
4 40	3.5888	3.5889	3.5891	3.5892	3.5893	3.5894	3.5895	3.5896	3.5897	3.5898	
4 50	3.5899	3.5901	3.5902	3.5903	3.5904	3.5905	3.5906	3.5907	3.5908	3.5910	
1 5 0	3.5911	3.5912	3.5913	3.5914	3.5915	3.5916	3.5917	3.5918	3.5920	3.5921	
5 10	3.5922	3.5923	3.5924	3.5925	3.5926	3.5927	3.5928	3.5930	3.5931	3.5932	
5 20	3.5933	3.5934	3.5935	3.5936	3.5937	3.5938	3.5940	3.5941	3.5942	3.5943	
5 30	3.5944	3.5945	3.5946	3.5947	3.5948	3.5949	3.5951	3.5952	3.5953	3.5954	
5 40	3.5955	3.5956	3.5957	3.5958	3.5959	3.5960	3.5962	3.5963	3.5964	3.5965	
5 50	3.5966	3.5967	3.5968	3.5969	3.5970	3.5971	3.5973	3.5974	3.5975	3.5976	
1 6 0	3.5977	3.5978	3.5979	3.5980	3.5981	3.5982	3.5984	3.5985	3.5986	3.5987	
6 10	3.5988	3.5989	3.5990	3.5991	3.5992	3.5993	3.5994	3.5996	3.5997	3.5998	
6 20	3.5999	3.6000	3.6001	3.6002	3.6003	3.6004	3.6005	3.6006	3.6008	3.6009	
6 30	3.6010	3.6011	3.6012	3.6013	3.6014	3.6015	3.6016	3.6017	3.6018	3.6020	
6 40	3.6021	3.6022	3.6023	3.6024	3.6025	3.6026	3.6027	3.6028	3.6029	3.6030	
6 50	3.6031	3.6033	3.6034	3.6035	3.6036	3.6037	3.6038	3.6039	3.6040	3.6041	
1 7 0	3.6042	3.6043	3.6044	3.6046	3.6047	3.6048	3.6049	3.6050	3.6051	3.6052	
7 10	3.6053	3.6054	3.6055	3.6056	3.6057	3.6058	3.6060	3.6061	3.6062	3.6063	
7 20	3.6064	3.6065	3.6066	3.6067	3.6068	3.6069	3.6070	3.6071	3.6072	3.6073	
7 30	3.6075	3.6076	3.6077	3.6078	3.6079	3.6080	3.6081	3.6082	3.6083	3.6084	
7 40	3.6085	3.6086	3.6087	3.6088	3.6090	3.6091	3.6092	3.6093	3.6094	3.6095	
7 50	3.6096	3.6097	3.6098	3.6099	3.6100	3.6101	3.6102	3.6103	3.6104	3.6106	
1 8 0	3.6107	3.6108	3.6109	3.6110	3.6111	3.6112	3.6113	3.6114	3.6115	3.6116	
8 10	3.6117	3.6118	3.6119	3.6120	3.6121	3.6123	3.6124	3.6125	3.6126	3.6127	
8 20	3.6128	3.6129	3.6130	3.6131	3.6132	3.6133	3.6134	3.6135	3.6136	3.6137	
8 30	3.6138	3.6139	3.6141	3.6142	3.6143	3.6144	3.6145	3.6146	3.6147	3.6148	
8 40	3.6149	3.6150	3.6151	3.6152	3.6153	3.6154	3.6155	3.6156	3.6157	3.6158	
8 50	3.6160	3.6161	3.6162	3.6163	3.6164	3.6165	3.6166	3.6167	3.6168	3.6169	
1 9 0	3.6170	3.6171	3.6172	3.6173	3.6174	3.6175	3.6176	3.6177	3.6178	3.6179	
9 10	3.6180	3.6182	3.6183	3.6184	3.6185	3.6186	3.6187	3.6188	3.6189	3.6190	
9 20	3.6191	3.6192	3.6193	3.6194	3.6195	3.6196	3.6197	3.6198	3.6199	3.6200	
9 30	3.6201	3.6202	3.6203	3.6204	3.6206	3.6207	3.6208	3.6209	3.6210	3.6211	
9 40	3.6212	3.6213	3.6214	3.6215	3.6216	3.6217	3.6218	3.6219	3.6220	3.6221	
9 50	3.6222	3.6223	3.6224	3.6225	3.6226	3.6227	3.6228	3.6229	3.6230	3.6231	

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
1° 10' 0"	3.6232	3.6234	3.6235	3.6236	3.6237	3.6238	3.6239	3.6240	3.6241	3.6242
10 10	3.6243	3.6244	3.6245	3.6246	3.6247	3.6248	3.6249	3.6250	3.6251	3.6252
10 20	3.6253	3.6254	3.6255	3.6256	3.6257	3.6258	3.6259	3.6260	3.6261	3.6262
10 30	3.6263	3.6264	3.6265	3.6266	3.6268	3.6269	3.6270	3.6271	3.6272	3.6273
10 40	3.6274	3.6275	3.6276	3.6277	3.6278	3.6279	3.6280	3.6281	3.6282	3.6283
10 50	3.6284	3.6285	3.6286	3.6287	3.6288	3.6289	3.6290	3.6291	3.6292	3.6293
1 11 0	3.6294	3.6295	3.6296	3.6297	3.6298	3.6299	3.6300	3.6301	3.6302	3.6303
11 10	3.6304	3.6305	3.6306	3.6307	3.6308	3.6309	3.6310	3.6311	3.6312	3.6313
11 20	3.6314	3.6315	3.6316	3.6317	3.6318	3.6320	3.6321	3.6322	3.6323	3.6324
11 30	3.6325	3.6326	3.6327	3.6328	3.6329	3.6330	3.6331	3.6332	3.6333	3.6334
11 40	3.6335	3.6336	3.6337	3.6338	3.6339	3.6340	3.6341	3.6342	3.6343	3.6344
11 50	3.6345	3.6346	3.6347	3.6348	3.6349	3.6350	3.6351	3.6352	3.6353	3.6354
1 12 0	3.6355	3.6356	3.6357	3.6358	3.6359	3.6360	3.6361	3.6362	3.6363	3.6364
12 10	3.6365	3.6366	3.6367	3.6368	3.6369	3.6370	3.6371	3.6372	3.6373	3.6374
12 20	3.6375	3.6376	3.6377	3.6378	3.6379	3.6380	3.6381	3.6382	3.6383	3.6384
12 30	3.6385	3.6386	3.6387	3.6388	3.6389	3.6390	3.6391	3.6392	3.6393	3.6394
12 40	3.6395	3.6396	3.6397	3.6398	3.6399	3.6400	3.6401	3.6402	3.6403	3.6404
12 50	3.6405	3.6406	3.6407	3.6408	3.6409	3.6410	3.6411	3.6412	3.6413	3.6414
1 13 0	3.6415	3.6416	3.6417	3.6418	3.6419	3.6420	3.6421	3.6422	3.6423	3.6424
13 10	3.6425	3.6426	3.6427	3.6428	3.6429	3.6430	3.6431	3.6432	3.6433	3.6434
13 20	3.6435	3.6436	3.6437	3.6438	3.6439	3.6440	3.6441	3.6442	3.6443	3.6444
13 30	3.6445	3.6446	3.6447	3.6448	3.6449	3.6450	3.6451	3.6452	3.6453	3.6454
13 40	3.6455	3.6456	3.6457	3.6458	3.6459	3.6460	3.6461	3.6462	3.6463	3.6464
13 50	3.6465	3.6466	3.6467	3.6468	3.6469	3.6470	3.6471	3.6472	3.6473	3.6474
1 14 0	3.6475	3.6476	3.6477	3.6478	3.6479	3.6480	3.6481	3.6482	3.6483	3.6484
14 10	3.6485	3.6486	3.6487	3.6488	3.6489	3.6490	3.6491	3.6492	3.6493	3.6494
14 20	3.6495	3.6496	3.6497	3.6498	3.6499	3.6500	3.6501	3.6502	3.6503	3.6504
14 30	3.6505	3.6506	3.6507	3.6508	3.6509	3.6510	3.6511	3.6512	3.6513	3.6514
14 40	3.6515	3.6516	3.6517	3.6518	3.6519	3.6520	3.6521	3.6522	3.6523	3.6524
14 50	3.6525	3.6526	3.6527	3.6528	3.6529	3.6530	3.6531	3.6532	3.6533	3.6534
1 15 0	3.6535	3.6536	3.6537	3.6538	3.6539	3.6540	3.6541	3.6542	3.6543	3.6544
15 10	3.6545	3.6546	3.6547	3.6548	3.6549	3.6550	3.6551	3.6552	3.6553	3.6554
15 20	3.6555	3.6556	3.6557	3.6558	3.6559	3.6560	3.6561	3.6562	3.6563	3.6564
15 30	3.6565	3.6566	3.6567	3.6568	3.6569	3.6570	3.6571	3.6572	3.6573	3.6574
15 40	3.6575	3.6576	3.6577	3.6578	3.6579	3.6580	3.6581	3.6582	3.6583	3.6584
15 50	3.6585	3.6586	3.6587	3.6588	3.6589	3.6590	3.6591	3.6592	3.6593	3.6594
1 16 0	3.6595	3.6596	3.6597	3.6598	3.6599	3.6600	3.6601	3.6602	3.6603	3.6604
16 10	3.6605	3.6606	3.6607	3.6608	3.6609	3.6610	3.6611	3.6612	3.6613	3.6614
16 20	3.6615	3.6616	3.6617	3.6618	3.6619	3.6620	3.6621	3.6622	3.6623	3.6624
16 30	3.6625	3.6626	3.6627	3.6628	3.6629	3.6630	3.6631	3.6632	3.6633	3.6634
16 40	3.6635	3.6636	3.6637	3.6638	3.6639	3.6640	3.6641	3.6642	3.6643	3.6644
16 50	3.6645	3.6646	3.6647	3.6648	3.6649	3.6650	3.6651	3.6652	3.6653	3.6654
1 17 0	3.6655	3.6656	3.6657	3.6658	3.6659	3.6660	3.6661	3.6662	3.6663	3.6664
17 10	3.6665	3.6666	3.6667	3.6668	3.6669	3.6670	3.6671	3.6672	3.6673	3.6674
17 20	3.6675	3.6676	3.6677	3.6678	3.6679	3.6680	3.6681	3.6682	3.6683	3.6684
17 30	3.6685	3.6686	3.6687	3.6688	3.6689	3.6690	3.6691	3.6692	3.6693	3.6694
17 40	3.6695	3.6696	3.6697	3.6698	3.6699	3.6700	3.6701	3.6702	3.6703	3.6704
17 50	3.6705	3.6706	3.6707	3.6708	3.6709	3.6710	3.6711	3.6712	3.6713	3.6714
1 18 0	3.6715	3.6716	3.6717	3.6718	3.6719	3.6720	3.6721	3.6722	3.6723	3.6724
18 10	3.6725	3.6726	3.6727	3.6728	3.6729	3.6730	3.6731	3.6732	3.6733	3.6734
18 20	3.6735	3.6736	3.6737	3.6738	3.6739	3.6740	3.6741	3.6742	3.6743	3.6744
18 30	3.6745	3.6746	3.6747	3.6748	3.6749	3.6750	3.6751	3.6752	3.6753	3.6754
18 40	3.6755	3.6756	3.6757	3.6758	3.6759	3.6760	3.6761	3.6762	3.6763	3.6764
18 50	3.6765	3.6766	3.6767	3.6768	3.6769	3.6770	3.6771	3.6772	3.6773	3.6774
1 19 0	3.6775	3.6776	3.6777	3.6778	3.6779	3.6780	3.6781	3.6782	3.6783	3.6784
19 10	3.6785	3.6786	3.6787	3.6788	3.6789	3.6790	3.6791	3.6792	3.6793	3.6794
19 20	3.6795	3.6796	3.6797	3.6798	3.6799	3.6800	3.6801	3.6802	3.6803	3.6804
19 30	3.6805	3.6806	3.6807	3.6808	3.6809	3.6810	3.6811	3.6812	3.6813	3.6814
19 40	3.6815	3.6816	3.6817	3.6818	3.6819	3.6820	3.6821	3.6822	3.6823	3.6824
19 50	3.6825	3.6826	3.6827	3.6828	3.6829	3.6830	3.6831	3.6832	3.6833	3.6834

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
1 0 0	3.6812	3.6813	3.6814	3.6815	3.6816	3.6817	3.6818	3.6819	3.6820	3.6821
20 10	3.6821	3.6822	3.6823	3.6824	3.6825	3.6826	3.6827	3.6828	3.6829	3.6830
20 20	3.6830	3.6831	3.6832	3.6833	3.6834	3.6835	3.6836	3.6837	3.6838	3.6839
20 30	3.6839	3.6840	3.6841	3.6842	3.6843	3.6844	3.6845	3.6846	3.6847	3.6848
20 40	3.6848	3.6849	3.6850	3.6851	3.6852	3.6853	3.6854	3.6855	3.6856	3.6857
20 50	3.6857	3.6858	3.6859	3.6860	3.6861	3.6862	3.6863	3.6864	3.6865	3.6866
1 21 0	3.6866	3.6867	3.6868	3.6869	3.6870	3.6871	3.6872	3.6873	3.6874	3.6875
21 10	3.6875	3.6876	3.6877	3.6878	3.6879	3.6880	3.6881	3.6882	3.6883	3.6884
21 20	3.6884	3.6885	3.6886	3.6887	3.6888	3.6889	3.6890	3.6891	3.6892	3.6893
21 30	3.6893	3.6894	3.6895	3.6896	3.6897	3.6898	3.6899	3.6900	3.6901	3.6902
21 40	3.6902	3.6903	3.6904	3.6905	3.6906	3.6907	3.6908	3.6909	3.6910	3.6911
21 50	3.6911	3.6912	3.6913	3.6914	3.6915	3.6916	3.6917	3.6918	3.6919	3.6920
1 22 0	3.6920	3.6921	3.6922	3.6923	3.6924	3.6925	3.6926	3.6927	3.6928	3.6929
22 10	3.6928	3.6929	3.6930	3.6931	3.6932	3.6933	3.6934	3.6935	3.6936	3.6937
22 20	3.6937	3.6938	3.6939	3.6940	3.6941	3.6942	3.6943	3.6944	3.6945	3.6946
22 30	3.6946	3.6947	3.6948	3.6949	3.6950	3.6951	3.6952	3.6953	3.6954	3.6955
22 40	3.6955	3.6956	3.6957	3.6958	3.6959	3.6960	3.6961	3.6962	3.6963	3.6964
22 50	3.6964	3.6965	3.6966	3.6967	3.6968	3.6969	3.6970	3.6971	3.6972	3.6973
1 23 0	3.6972	3.6973	3.6974	3.6975	3.6976	3.6977	3.6978	3.6979	3.6980	3.6981
23 10	3.6981	3.6982	3.6983	3.6984	3.6985	3.6986	3.6987	3.6988	3.6989	3.6990
23 20	3.6990	3.6991	3.6992	3.6993	3.6994	3.6995	3.6996	3.6997	3.6998	3.6999
23 30	3.6998	3.6999	3.7000	3.7001	3.7002	3.7003	3.7004	3.7005	3.7006	3.7007
23 40	3.7007	3.7008	3.7009	3.7010	3.7011	3.7012	3.7013	3.7014	3.7015	3.7016
23 50	3.7016	3.7017	3.7018	3.7019	3.7020	3.7021	3.7022	3.7023	3.7024	3.7025
1 24 0	3.7024	3.7025	3.7026	3.7027	3.7028	3.7029	3.7030	3.7031	3.7032	3.7033
24 10	3.7033	3.7034	3.7035	3.7036	3.7037	3.7038	3.7039	3.7040	3.7041	3.7042
24 20	3.7042	3.7043	3.7044	3.7045	3.7046	3.7047	3.7048	3.7049	3.7050	3.7051
24 30	3.7050	3.7051	3.7052	3.7053	3.7054	3.7055	3.7056	3.7057	3.7058	3.7059
24 40	3.7059	3.7060	3.7061	3.7062	3.7063	3.7064	3.7065	3.7066	3.7067	3.7068
24 50	3.7067	3.7068	3.7069	3.7070	3.7071	3.7072	3.7073	3.7074	3.7075	3.7076
1 25 0	3.7076	3.7077	3.7078	3.7079	3.7080	3.7081	3.7082	3.7083	3.7084	3.7085
25 10	3.7084	3.7085	3.7086	3.7087	3.7088	3.7089	3.7090	3.7091	3.7092	3.7093
25 20	3.7093	3.7094	3.7095	3.7096	3.7097	3.7098	3.7099	3.7100	3.7101	3.7102
25 30	3.7101	3.7102	3.7103	3.7104	3.7105	3.7106	3.7107	3.7108	3.7109	3.7110
25 40	3.7110	3.7111	3.7112	3.7113	3.7114	3.7115	3.7116	3.7117	3.7118	3.7119
25 50	3.7118	3.7119	3.7120	3.7121	3.7122	3.7123	3.7124	3.7125	3.7126	3.7127
1 26 0	3.7126	3.7127	3.7128	3.7129	3.7130	3.7131	3.7132	3.7133	3.7134	3.7135
26 10	3.7135	3.7136	3.7137	3.7138	3.7139	3.7140	3.7141	3.7142	3.7143	3.7144
26 20	3.7143	3.7144	3.7145	3.7146	3.7147	3.7148	3.7149	3.7150	3.7151	3.7152
26 30	3.7152	3.7153	3.7154	3.7155	3.7156	3.7157	3.7158	3.7159	3.7160	3.7161
26 40	3.7160	3.7161	3.7162	3.7163	3.7164	3.7165	3.7166	3.7167	3.7168	3.7169
26 50	3.7168	3.7169	3.7170	3.7171	3.7172	3.7173	3.7174	3.7175	3.7176	3.7177
1 27 0	3.7177	3.7178	3.7179	3.7180	3.7181	3.7182	3.7183	3.7184	3.7185	3.7186
27 10	3.7185	3.7186	3.7187	3.7188	3.7189	3.7190	3.7191	3.7192	3.7193	3.7194
27 20	3.7193	3.7194	3.7195	3.7196	3.7197	3.7198	3.7199	3.7200	3.7201	3.7202
27 30	3.7202	3.7203	3.7204	3.7205	3.7206	3.7207	3.7208	3.7209	3.7210	3.7211
27 40	3.7210	3.7211	3.7212	3.7213	3.7214	3.7215	3.7216	3.7217	3.7218	3.7219
27 50	3.7218	3.7219	3.7220	3.7221	3.7222	3.7223	3.7224	3.7225	3.7226	3.7227
1 28 0	3.7226	3.7227	3.7228	3.7229	3.7230	3.7231	3.7232	3.7233	3.7234	3.7235
28 10	3.7235	3.7236	3.7237	3.7238	3.7239	3.7240	3.7241	3.7242	3.7243	3.7244
28 20	3.7243	3.7244	3.7245	3.7246	3.7247	3.7248	3.7249	3.7250	3.7251	3.7252
28 30	3.7251	3.7252	3.7253	3.7254	3.7255	3.7256	3.7257	3.7258	3.7259	3.7260
28 40	3.7259	3.7260	3.7261	3.7262	3.7263	3.7264	3.7265	3.7266	3.7267	3.7268
28 50	3.7267	3.7268	3.7269	3.7270	3.7271	3.7272	3.7273	3.7274	3.7275	3.7276
1 29 0	3.7275	3.7276	3.7277	3.7278	3.7279	3.7280	3.7281	3.7282	3.7283	3.7284
29 10	3.7283	3.7284	3.7285	3.7286	3.7287	3.7288	3.7289	3.7290	3.7291	3.7292
29 20	3.7291	3.7292	3.7293	3.7294	3.7295	3.7296	3.7297	3.7298	3.7299	3.7300
29 30	3.7300	3.7301	3.7302	3.7303	3.7304	3.7305	3.7306	3.7307	3.7308	3.7309
29 40	3.7308	3.7309	3.7310	3.7311	3.7312	3.7313	3.7314	3.7315	3.7316	3.7317
29 50	3.7316	3.7317	3.7318	3.7319	3.7320	3.7321	3.7322	3.7323	3.7324	3.7325

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
1° 30' 0"	3.7324	3.7325	3.7326	3.7326	3.7327	3.7328	3.7329	3.7330	3.7330	3.7331
30 10	3.7332	3.7333	3.7334	3.7334	3.7335	3.7336	3.7337	3.7338	3.7338	3.7339
30 20	3.7340	3.7341	3.7342	3.7342	3.7343	3.7344	3.7345	3.7346	3.7346	3.7347
30 30	3.7348	3.7349	3.7350	3.7350	3.7351	3.7352	3.7353	3.7354	3.7354	3.7355
30 40	3.7356	3.7357	3.7358	3.7358	3.7359	3.7360	3.7361	3.7362	3.7362	3.7363
30 50	3.7364	3.7365	3.7366	3.7366	3.7367	3.7368	3.7369	3.7370	3.7370	3.7371
1 31 0	3.7372	3.7373	3.7374	3.7374	3.7375	3.7376	3.7377	3.7377	3.7378	3.7379
31 10	3.7380	3.7381	3.7381	3.7382	3.7383	3.7384	3.7385	3.7385	3.7386	3.7387
31 20	3.7388	3.7389	3.7389	3.7390	3.7391	3.7392	3.7393	3.7393	3.7394	3.7395
31 30	3.7396	3.7397	3.7397	3.7398	3.7399	3.7400	3.7400	3.7401	3.7402	3.7403
31 40	3.7404	3.7404	3.7405	3.7406	3.7407	3.7408	3.7408	3.7409	3.7410	3.7411
31 50	3.7412	3.7412	3.7413	3.7414	3.7415	3.7415	3.7416	3.7417	3.7418	3.7419
1 32 0	3.7419	3.7420	3.7421	3.7422	3.7423	3.7423	3.7424	3.7425	3.7426	3.7426
32 10	3.7427	3.7428	3.7429	3.7430	3.7430	3.7431	3.7432	3.7433	3.7434	3.7434
32 20	3.7435	3.7436	3.7437	3.7437	3.7438	3.7439	3.7440	3.7441	3.7441	3.7442
32 30	3.7443	3.7444	3.7444	3.7445	3.7446	3.7447	3.7448	3.7448	3.7449	3.7450
32 40	3.7451	3.7452	3.7452	3.7453	3.7454	3.7455	3.7455	3.7456	3.7457	3.7458
32 50	3.7459	3.7459	3.7460	3.7461	3.7462	3.7462	3.7463	3.7464	3.7465	3.7466
1 33 0	3.7466	3.7467	3.7468	3.7469	3.7469	3.7470	3.7471	3.7472	3.7473	3.7473
33 10	3.7474	3.7475	3.7476	3.7476	3.7477	3.7478	3.7479	3.7480	3.7480	3.7481
33 20	3.7482	3.7483	3.7483	3.7484	3.7485	3.7486	3.7487	3.7487	3.7488	3.7489
33 30	3.7490	3.7490	3.7491	3.7492	3.7493	3.7493	3.7494	3.7495	3.7496	3.7497
33 40	3.7497	3.7498	3.7499	3.7500	3.7500	3.7501	3.7502	3.7503	3.7504	3.7504
33 50	3.7505	3.7506	3.7507	3.7507	3.7508	3.7509	3.7510	3.7510	3.7511	3.7512
1 34 0	3.7513	3.7514	3.7514	3.7515	3.7516	3.7517	3.7517	3.7518	3.7519	3.7520
34 10	3.7520	3.7521	3.7522	3.7523	3.7524	3.7524	3.7525	3.7526	3.7527	3.7527
34 20	3.7528	3.7529	3.7530	3.7530	3.7531	3.7532	3.7533	3.7534	3.7534	3.7535
34 30	3.7536	3.7537	3.7537	3.7538	3.7539	3.7540	3.7540	3.7541	3.7542	3.7543
34 40	3.7543	3.7544	3.7545	3.7546	3.7547	3.7547	3.7548	3.7549	3.7550	3.7550
34 50	3.7551	3.7552	3.7553	3.7553	3.7554	3.7555	3.7556	3.7556	3.7557	3.7558
1 35 0	3.7559	3.7560	3.7560	3.7561	3.7562	3.7563	3.7563	3.7564	3.7565	3.7566
35 10	3.7566	3.7567	3.7568	3.7569	3.7569	3.7570	3.7571	3.7572	3.7572	3.7573
35 20	3.7574	3.7575	3.7575	3.7576	3.7577	3.7578	3.7579	3.7579	3.7580	3.7581
35 30	3.7582	3.7582	3.7583	3.7584	3.7585	3.7585	3.7586	3.7587	3.7588	3.7588
35 40	3.7589	3.7590	3.7591	3.7591	3.7592	3.7593	3.7594	3.7594	3.7595	3.7596
35 50	3.7597	3.7597	3.7598	3.7599	3.7600	3.7600	3.7601	3.7602	3.7603	3.7603
1 36 0	3.7604	3.7605	3.7606	3.7606	3.7607	3.7608	3.7609	3.7609	3.7610	3.7611
36 10	3.7612	3.7613	3.7613	3.7614	3.7615	3.7616	3.7616	3.7617	3.7618	3.7619
36 20	3.7619	3.7620	3.7621	3.7622	3.7622	3.7623	3.7624	3.7625	3.7625	3.7626
36 30	3.7627	3.7628	3.7628	3.7629	3.7630	3.7631	3.7631	3.7632	3.7633	3.7634
36 40	3.7634	3.7635	3.7636	3.7637	3.7637	3.7638	3.7639	3.7640	3.7640	3.7641
36 50	3.7642	3.7643	3.7643	3.7644	3.7645	3.7645	3.7646	3.7647	3.7648	3.7648
1 37 0	3.7649	3.7650	3.7651	3.7651	3.7652	3.7653	3.7654	3.7654	3.7655	3.7656
37 10	3.7657	3.7657	3.7658	3.7659	3.7660	3.7660	3.7661	3.7662	3.7663	3.7663
37 20	3.7664	3.7665	3.7666	3.7666	3.7667	3.7668	3.7669	3.7669	3.7670	3.7671
37 30	3.7672	3.7672	3.7673	3.7674	3.7675	3.7675	3.7676	3.7677	3.7677	3.7678
37 40	3.7679	3.7680	3.7681	3.7681	3.7682	3.7683	3.7683	3.7684	3.7685	3.7686
37 50	3.7686	3.7687	3.7688	3.7689	3.7689	3.7690	3.7691	3.7692	3.7692	3.7693
1 38 0	3.7694	3.7695	3.7695	3.7696	3.7697	3.7697	3.7698	3.7699	3.7700	3.7700
38 10	3.7701	3.7702	3.7703	3.7703	3.7704	3.7705	3.7706	3.7706	3.7707	3.7708
38 20	3.7709	3.7709	3.7710	3.7711	3.7711	3.7712	3.7713	3.7714	3.7714	3.7715
38 30	3.7716	3.7717	3.7717	3.7718	3.7719	3.7720	3.7720	3.7721	3.7722	3.7722
38 40	3.7723	3.7724	3.7725	3.7725	3.7726	3.7727	3.7728	3.7728	3.7729	3.7730
38 50	3.7731	3.7731	3.7732	3.7733	3.7733	3.7734	3.7735	3.7736	3.7736	3.7737
1 39 0	3.7738	3.7739	3.7739	3.7740	3.7741	3.7742	3.7742	3.7743	3.7744	3.7744
39 10	3.7745	3.7746	3.7747	3.7747	3.7748	3.7749	3.7750	3.7750	3.7751	3.7752
39 20	3.7752	3.7753	3.7754	3.7755	3.7755	3.7756	3.7757	3.7758	3.7758	3.7759
39 30	3.7760	3.7760	3.7761	3.7762	3.7763	3.7763	3.7764	3.7765	3.7766	3.7766
39 40	3.7767	3.7768	3.7768	3.7769	3.7770	3.7771	3.7771	3.7772	3.7773	3.7774
39 50	3.7774	3.7775	3.7776	3.7776	3.7777	3.7778	3.7779	3.7779	3.7780	3.7781

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$1^{\circ} 40' 0''$	3.7782	3.7782	3.7783	3.7784	3.7784	3.7785	3.7786	3.7787	3.7787	3.7788
40 10	3.7789	3.7789	3.7790	3.7791	3.7792	3.7792	3.7793	3.7794	3.7795	3.7795
40 20	3.7796	3.7797	3.7797	3.7798	3.7799	3.7800	3.7800	3.7801	3.7802	3.7802
40 30	3.7803	3.7804	3.7805	3.7805	3.7806	3.7807	3.7807	3.7808	3.7809	3.7810
40 40	3.7810	3.7811	3.7812	3.7813	3.7813	3.7814	3.7815	3.7815	3.7816	3.7817
40 50	3.7818	3.7818	3.7819	3.7820	3.7820	3.7821	3.7822	3.7823	3.7823	3.7824
1 41 0	3.7825	3.7825	3.7826	3.7827	3.7828	3.7828	3.7829	3.7830	3.7830	3.7831
41 10	3.7832	3.7833	3.7833	3.7834	3.7835	3.7835	3.7836	3.7837	3.7838	3.7838
41 20	3.7839	3.7840	3.7840	3.7841	3.7842	3.7843	3.7843	3.7844	3.7845	3.7845
41 30	3.7846	3.7847	3.7848	3.7848	3.7849	3.7850	3.7850	3.7851	3.7852	3.7853
41 40	3.7853	3.7854	3.7855	3.7855	3.7856	3.7857	3.7858	3.7858	3.7859	3.7860
41 50	3.7860	3.7861	3.7862	3.7863	3.7863	3.7864	3.7865	3.7865	3.7866	3.7867
1 42 0	3.7868	3.7868	3.7869	3.7870	3.7870	3.7871	3.7872	3.7872	3.7873	3.7874
42 10	3.7875	3.7875	3.7876	3.7877	3.7877	3.7878	3.7879	3.7880	3.7880	3.7881
42 20	3.7882	3.7882	3.7883	3.7884	3.7885	3.7885	3.7886	3.7887	3.7887	3.7888
42 30	3.7889	3.7889	3.7890	3.7891	3.7892	3.7892	3.7893	3.7894	3.7894	3.7895
42 40	3.7896	3.7897	3.7897	3.7898	3.7899	3.7899	3.7900	3.7901	3.7901	3.7902
42 50	3.7903	3.7904	3.7904	3.7905	3.7906	3.7906	3.7907	3.7908	3.7908	3.7909
1 43 0	3.7910	3.7911	3.7911	3.7912	3.7913	3.7913	3.7914	3.7915	3.7916	3.7916
43 10	3.7917	3.7918	3.7918	3.7919	3.7920	3.7920	3.7921	3.7922	3.7923	3.7923
43 20	3.7924	3.7925	3.7925	3.7926	3.7927	3.7927	3.7928	3.7929	3.7930	3.7930
43 30	3.7931	3.7932	3.7933	3.7933	3.7934	3.7934	3.7935	3.7936	3.7937	3.7937
43 40	3.7938	3.7939	3.7939	3.7940	3.7941	3.7942	3.7942	3.7943	3.7943	3.7944
43 50	3.7945	3.7946	3.7946	3.7947	3.7948	3.7948	3.7949	3.7950	3.7950	3.7951
1 44 0	3.7952	3.7953	3.7953	3.7954	3.7955	3.7955	3.7956	3.7957	3.7957	3.7958
44 10	3.7959	3.7959	3.7960	3.7961	3.7962	3.7962	3.7963	3.7964	3.7964	3.7965
44 20	3.7966	3.7966	3.7967	3.7968	3.7969	3.7969	3.7970	3.7971	3.7971	3.7972
44 30	3.7973	3.7973	3.7974	3.7975	3.7975	3.7976	3.7977	3.7978	3.7978	3.7979
44 40	3.7980	3.7980	3.7981	3.7982	3.7982	3.7983	3.7984	3.7984	3.7985	3.7986
44 50	3.7987	3.7987	3.7988	3.7989	3.7989	3.7990	3.7991	3.7991	3.7992	3.7993
1 45 0	3.7993	3.7994	3.7995	3.7995	3.7996	3.7997	3.7998	3.7998	3.7999	3.8000
45 10	3.8000	3.8001	3.8002	3.8002	3.8003	3.8004	3.8004	3.8005	3.8006	3.8006
45 20	3.8007	3.8008	3.8009	3.8009	3.8010	3.8011	3.8011	3.8012	3.8013	3.8013
45 30	3.8014	3.8015	3.8015	3.8016	3.8017	3.8017	3.8018	3.8019	3.8020	3.8020
45 40	3.8021	3.8022	3.8022	3.8023	3.8024	3.8024	3.8025	3.8026	3.8026	3.8027
45 50	3.8028	3.8028	3.8029	3.8030	3.8030	3.8031	3.8032	3.8033	3.8033	3.8034
1 46 0	3.8035	3.8035	3.8036	3.8036	3.8037	3.8038	3.8039	3.8039	3.8040	3.8041
46 10	3.8041	3.8042	3.8043	3.8043	3.8044	3.8045	3.8045	3.8046	3.8047	3.8048
46 20	3.8048	3.8049	3.8050	3.8050	3.8051	3.8052	3.8052	3.8053	3.8054	3.8054
46 30	3.8055	3.8056	3.8056	3.8057	3.8058	3.8058	3.8059	3.8060	3.8060	3.8061
46 40	3.8062	3.8062	3.8063	3.8064	3.8065	3.8065	3.8066	3.8067	3.8067	3.8068
46 50	3.8069	3.8069	3.8070	3.8071	3.8071	3.8072	3.8073	3.8073	3.8074	3.8075
1 47 0	3.8075	3.8076	3.8077	3.8077	3.8078	3.8079	3.8079	3.8080	3.8081	3.8081
47 10	3.8082	3.8083	3.8083	3.8084	3.8085	3.8085	3.8086	3.8087	3.8088	3.8088
47 20	3.8089	3.8090	3.8090	3.8091	3.8092	3.8092	3.8093	3.8094	3.8094	3.8095
47 30	3.8096	3.8096	3.8097	3.8098	3.8098	3.8099	3.8099	3.8100	3.8101	3.8102
47 40	3.8102	3.8103	3.8104	3.8104	3.8105	3.8106	3.8106	3.8107	3.8108	3.8108
47 50	3.8109	3.8110	3.8110	3.8111	3.8112	3.8112	3.8113	3.8114	3.8114	3.8115
1 48 0	3.8116	3.8116	3.8117	3.8118	3.8118	3.8119	3.8120	3.8120	3.8121	3.8122
48 10	3.8122	3.8123	3.8124	3.8124	3.8125	3.8126	3.8126	3.8127	3.8128	3.8128
48 20	3.8129	3.8130	3.8130	3.8131	3.8132	3.8132	3.8133	3.8134	3.8134	3.8135
48 30	3.8136	3.8136	3.8137	3.8138	3.8138	3.8139	3.8140	3.8140	3.8141	3.8142
48 40	3.8142	3.8143	3.8144	3.8144	3.8145	3.8146	3.8146	3.8147	3.8148	3.8148
48 50	3.8149	3.8150	3.8150	3.8151	3.8152	3.8152	3.8153	3.8154	3.8154	3.8155
1 49 0	3.8156	3.8156	3.8157	3.8158	3.8158	3.8159	3.8160	3.8160	3.8161	3.8162
49 10	3.8162	3.8163	3.8164	3.8164	3.8165	3.8166	3.8166	3.8167	3.8168	3.8168
49 20	3.8169	3.8170	3.8170	3.8171	3.8172	3.8172	3.8173	3.8174	3.8174	3.8175
49 30	3.8176	3.8176	3.8177	3.8178	3.8178	3.8179	3.8180	3.8180	3.8181	3.8182
49 40	3.8182	3.8183	3.8184	3.8184	3.8185	3.8185	3.8186	3.8187	3.8188	3.8188
49 50	3.8189	3.8190	3.8190	3.8191	3.8191	3.8192	3.8193	3.8193	3.8194	3.8195

TABLE I

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.

Arc.	0	1	2	3	4	5	6	7	8	9
$1^{\circ} 50' 0''$	3.8195	3.8196	3.8197	3.8197	3.8198	3.8199	3.8199	3.8200	3.8201	3.8201
50 10	3.8202	3.8203	3.8203	3.8204	3.8205	3.8205	3.8206	3.8207	3.8207	3.8208
50 20	3.8209	3.8209	3.8210	3.8211	3.8211	3.8212	3.8213	3.8213	3.8214	3.8214
50 30	3.8215	3.8216	3.8216	3.8217	3.8218	3.8218	3.8219	3.8220	3.8220	3.8221
50 40	3.8222	3.8222	3.8223	3.8224	3.8224	3.8225	3.8226	3.8226	3.8227	3.8228
50 50	3.8228	3.8229	3.8230	3.8230	3.8231	3.8231	3.8232	3.8233	3.8233	3.8234
1 51 0	3.8235	3.8235	3.8236	3.8237	3.8237	3.8238	3.8239	3.8239	3.8240	3.8241
51 10	3.8241	3.8242	3.8243	3.8243	3.8244	3.8245	3.8245	3.8246	3.8246	3.8247
51 20	3.8248	3.8248	3.8249	3.8250	3.8250	3.8251	3.8252	3.8252	3.8253	3.8254
51 30	3.8254	3.8255	3.8256	3.8256	3.8257	3.8258	3.8258	3.8259	3.8259	3.8260
51 40	3.8261	3.8261	3.8262	3.8263	3.8263	3.8264	3.8265	3.8265	3.8266	3.8267
51 50	3.8267	3.8268	3.8269	3.8269	3.8270	3.8270	3.8271	3.8272	3.8272	3.8273
1 52 0	3.8274	3.8274	3.8275	3.8276	3.8276	3.8277	3.8278	3.8278	3.8279	3.8280
52 10	3.8280	3.8281	3.8281	3.8282	3.8283	3.8283	3.8284	3.8285	3.8285	3.8286
52 20	3.8287	3.8287	3.8288	3.8289	3.8289	3.8290	3.8290	3.8291	3.8292	3.8292
52 30	3.8293	3.8294	3.8294	3.8295	3.8296	3.8296	3.8297	3.8298	3.8298	3.8299
52 40	3.8299	3.8300	3.8301	3.8301	3.8302	3.8303	3.8303	3.8304	3.8305	3.8305
52 50	3.8306	3.8307	3.8307	3.8308	3.8308	3.8309	3.8310	3.8310	3.8311	3.8312
1 53 0	3.8312	3.8313	3.8314	3.8314	3.8315	3.8315	3.8316	3.8317	3.8317	3.8318
53 10	3.8319	3.8319	3.8320	3.8321	3.8321	3.8322	3.8323	3.8323	3.8324	3.8324
53 20	3.8325	3.8326	3.8326	3.8327	3.8328	3.8328	3.8329	3.8330	3.8330	3.8331
53 30	3.8331	3.8332	3.8333	3.8333	3.8334	3.8335	3.8335	3.8336	3.8337	3.8337
53 40	3.8338	3.8338	3.8339	3.8340	3.8340	3.8341	3.8342	3.8342	3.8343	3.8344
53 50	3.8344	3.8345	3.8345	3.8346	3.8347	3.8347	3.8348	3.8349	3.8349	3.8350
1 54 0	3.8351	3.8351	3.8352	3.8353	3.8353	3.8354	3.8354	3.8355	3.8356	3.8356
54 10	3.8357	3.8358	3.8358	3.8359	3.8359	3.8360	3.8361	3.8361	3.8362	3.8363
54 20	3.8363	3.8364	3.8365	3.8365	3.8366	3.8366	3.8367	3.8368	3.8368	3.8369
54 30	3.8370	3.8370	3.8371	3.8371	3.8372	3.8373	3.8373	3.8374	3.8375	3.8375
54 40	3.8376	3.8377	3.8377	3.8378	3.8378	3.8379	3.8380	3.8380	3.8381	3.8382
54 50	3.8382	3.8383	3.8383	3.8384	3.8385	3.8385	3.8386	3.8387	3.8387	3.8388
1 55 0	3.8388	3.8389	3.8390	3.8390	3.8391	3.8392	3.8392	3.8393	3.8394	3.8394
55 10	3.8395	3.8395	3.8396	3.8397	3.8397	3.8398	3.8399	3.8399	3.8400	3.8400
55 20	3.8401	3.8402	3.8402	3.8403	3.8404	3.8404	3.8405	3.8405	3.8406	3.8407
55 30	3.8407	3.8408	3.8409	3.8409	3.8410	3.8410	3.8411	3.8412	3.8412	3.8413
55 40	3.8414	3.8414	3.8415	3.8415	3.8416	3.8417	3.8417	3.8418	3.8419	3.8419
55 50	3.8420	3.8420	3.8421	3.8422	3.8422	3.8423	3.8424	3.8424	3.8425	3.8425
1 56 0	3.8426	3.8427	3.8427	3.8428	3.8429	3.8429	3.8430	3.8430	3.8431	3.8432
56 10	3.8432	3.8433	3.8434	3.8434	3.8435	3.8435	3.8436	3.8437	3.8437	3.8438
56 20	3.8439	3.8439	3.8440	3.8440	3.8441	3.8442	3.8442	3.8443	3.8444	3.8444
56 30	3.8445	3.8445	3.8446	3.8447	3.8447	3.8448	3.8448	3.8449	3.8450	3.8450
56 40	3.8451	3.8452	3.8452	3.8453	3.8453	3.8454	3.8455	3.8455	3.8456	3.8457
56 50	3.8457	3.8458	3.8458	3.8459	3.8460	3.8460	3.8461	3.8462	3.8462	3.8463
1 57 0	3.8463	3.8464	3.8465	3.8465	3.8466	3.8466	3.8467	3.8468	3.8468	3.8469
57 10	3.8470	3.8470	3.8471	3.8471	3.8472	3.8473	3.8473	3.8474	3.8474	3.8475
57 20	3.8476	3.8476	3.8477	3.8478	3.8478	3.8479	3.8479	3.8480	3.8481	3.8481
57 30	3.8482	3.8483	3.8483	3.8484	3.8484	3.8485	3.8486	3.8486	3.8487	3.8487
57 40	3.8488	3.8489	3.8489	3.8490	3.8491	3.8491	3.8492	3.8492	3.8493	3.8494
57 50	3.8494	3.8495	3.8495	3.8496	3.8497	3.8497	3.8498	3.8499	3.8499	3.8500
1 58 0	3.8500	3.8501	3.8502	3.8502	3.8503	3.8503	3.8504	3.8505	3.8505	3.8506
58 10	3.8506	3.8507	3.8508	3.8508	3.8509	3.8510	3.8510	3.8511	3.8511	3.8512
58 20	3.8513	3.8513	3.8514	3.8514	3.8515	3.8516	3.8516	3.8517	3.8517	3.8518
58 30	3.8519	3.8519	3.8520	3.8521	3.8521	3.8522	3.8522	3.8523	3.8524	3.8524
58 40	3.8525	3.8525	3.8526	3.8527	3.8527	3.8528	3.8528	3.8529	3.8530	3.8530
58 50	3.8531	3.8532	3.8532	3.8533	3.8533	3.8534	3.8535	3.8535	3.8536	3.8536
1 59 0	3.8537	3.8538	3.8538	3.8539	3.8539	3.8540	3.8541	3.8541	3.8542	3.8542
59 10	3.8543	3.8544	3.8544	3.8545	3.8545	3.8546	3.8547	3.8547	3.8548	3.8549
59 20	3.8549	3.8550	3.8550	3.8551	3.8552	3.8552	3.8553	3.8553	3.8554	3.8555
59 30	3.8555	3.8556	3.8556	3.8557	3.8558	3.8558	3.8559	3.8559	3.8560	3.8561
59 40	3.8561	3.8562	3.8562	3.8563	3.8564	3.8564	3.8565	3.8565	3.8566	3.8567
59 50	3.8567	3.8568	3.8568	3.8569	3.8570	3.8570	3.8571	3.8572	3.8572	3.8573

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.											
Arc.	0	1	2	3	4	5	6	7	8	9	
2 ^h 0 ^m 0 ^s	3.8573	3.8574	3.8575	3.8575	3.8576	3.8576	3.8577	3.8578	3.8578	3.8579	
0 10	3.8579	3.8580	3.8581	3.8581	3.8582	3.8582	3.8583	3.8584	3.8584	3.8585	
0 20	3.8585	3.8586	3.8587	3.8587	3.8588	3.8588	3.8589	3.8590	3.8590	3.8591	
0 30	3.8591	3.8592	3.8593	3.8593	3.8594	3.8594	3.8595	3.8596	3.8596	3.8597	
0 40	3.8597	3.8598	3.8599	3.8599	3.8600	3.8600	3.8601	3.8602	3.8602	3.8603	
0 50	3.8603	3.8604	3.8605	3.8605	3.8606	3.8606	3.8607	3.8608	3.8608	3.8609	
2 1 0	3.8609	3.8610	3.8611	3.8611	3.8612	3.8612	3.8613	3.8614	3.8614	3.8615	
1 10	3.8615	3.8616	3.8617	3.8617	3.8618	3.8618	3.8619	3.8620	3.8620	3.8621	
1 20	3.8621	3.8622	3.8623	3.8623	3.8624	3.8624	3.8625	3.8625	3.8626	3.8627	
1 30	3.8627	3.8628	3.8628	3.8629	3.8630	3.8630	3.8631	3.8631	3.8632	3.8633	
1 40	3.8633	3.8634	3.8634	3.8635	3.8636	3.8636	3.8637	3.8637	3.8638	3.8639	
1 50	3.8639	3.8640	3.8640	3.8641	3.8642	3.8642	3.8643	3.8643	3.8644	3.8645	
2 2 0	3.8645	3.8646	3.8646	3.8647	3.8647	3.8648	3.8649	3.8649	3.8650	3.8650	
2 10	3.8651	3.8652	3.8652	3.8653	3.8653	3.8654	3.8655	3.8655	3.8656	3.8656	
2 20	3.8657	3.8658	3.8658	3.8659	3.8659	3.8660	3.8661	3.8661	3.8662	3.8662	
2 30	3.8663	3.8663	3.8664	3.8665	3.8665	3.8666	3.8666	3.8667	3.8668	3.8668	
2 40	3.8669	3.8669	3.8670	3.8671	3.8671	3.8672	3.8672	3.8673	3.8673	3.8674	
2 50	3.8675	3.8675	3.8676	3.8676	3.8677	3.8678	3.8678	3.8679	3.8679	3.8680	
2 3 0	3.8681	3.8681	3.8682	3.8682	3.8683	3.8684	3.8684	3.8685	3.8685	3.8686	
3 10	3.8686	3.8687	3.8688	3.8688	3.8689	3.8689	3.8690	3.8691	3.8691	3.8692	
3 20	3.8692	3.8693	3.8693	3.8694	3.8695	3.8695	3.8696	3.8696	3.8697	3.8698	
3 30	3.8698	3.8699	3.8699	3.8700	3.8701	3.8701	3.8702	3.8702	3.8703	3.8703	
3 40	3.8704	3.8705	3.8705	3.8706	3.8706	3.8707	3.8708	3.8708	3.8709	3.8709	
3 50	3.8710	3.8710	3.8711	3.8712	3.8712	3.8713	3.8713	3.8714	3.8715	3.8715	
2 4 0	3.8716	3.8716	3.8717	3.8717	3.8718	3.8719	3.8719	3.8720	3.8720	3.8721	
4 10	3.8722	3.8722	3.8723	3.8723	3.8724	3.8724	3.8725	3.8726	3.8726	3.8727	
4 20	3.8727	3.8728	3.8729	3.8729	3.8730	3.8730	3.8731	3.8731	3.8732	3.8733	
4 30	3.8733	3.8734	3.8734	3.8735	3.8736	3.8736	3.8737	3.8737	3.8738	3.8738	
4 40	3.8739	3.8740	3.8740	3.8741	3.8741	3.8742	3.8742	3.8743	3.8744	3.8744	
4 50	3.8745	3.8745	3.8746	3.8747	3.8747	3.8748	3.8748	3.8749	3.8749	3.8750	
2 5 0	3.8751	3.8751	3.8752	3.8752	3.8753	3.8754	3.8754	3.8755	3.8755	3.8756	
5 10	3.8756	3.8757	3.8758	3.8758	3.8759	3.8759	3.8760	3.8760	3.8761	3.8762	
5 20	3.8762	3.8763	3.8763	3.8764	3.8764	3.8765	3.8766	3.8766	3.8767	3.8767	
5 30	3.8768	3.8769	3.8769	3.8770	3.8770	3.8771	3.8771	3.8772	3.8773	3.8773	
5 40	3.8774	3.8774	3.8775	3.8775	3.8776	3.8777	3.8777	3.8778	3.8778	3.8779	
5 50	3.8779	3.8780	3.8781	3.8781	3.8782	3.8782	3.8783	3.8783	3.8784	3.8785	
2 6 0	3.8785	3.8786	3.8786	3.8787	3.8788	3.8788	3.8789	3.8789	3.8790	3.8790	
6 10	3.8791	3.8792	3.8792	3.8793	3.8793	3.8794	3.8794	3.8795	3.8796	3.8796	
6 20	3.8797	3.8797	3.8798	3.8798	3.8799	3.8800	3.8800	3.8801	3.8801	3.8802	
6 30	3.8802	3.8803	3.8804	3.8804	3.8805	3.8805	3.8806	3.8806	3.8807	3.8808	
6 40	3.8808	3.8809	3.8809	3.8810	3.8810	3.8811	3.8812	3.8812	3.8813	3.8813	
6 50	3.8814	3.8814	3.8815	3.8816	3.8816	3.8817	3.8817	3.8818	3.8818	3.8819	
2 7 0	3.8820	3.8820	3.8821	3.8821	3.8822	3.8822	3.8823	3.8824	3.8824	3.8825	
7 10	3.8825	3.8826	3.8826	3.8827	3.8828	3.8828	3.8829	3.8829	3.8830	3.8830	
7 20	3.8831	3.8832	3.8832	3.8833	3.8833	3.8834	3.8834	3.8835	3.8835	3.8836	
7 30	3.8837	3.8837	3.8838	3.8838	3.8839	3.8839	3.8840	3.8841	3.8841	3.8842	
7 40	3.8842	3.8843	3.8843	3.8844	3.8845	3.8845	3.8846	3.8846	3.8847	3.8847	
7 50	3.8848	3.8849	3.8849	3.8850	3.8850	3.8851	3.8851	3.8852	3.8852	3.8853	
2 8 0	3.8854	3.8854	3.8855	3.8855	3.8856	3.8856	3.8857	3.8858	3.8858	3.8859	
8 10	3.8859	3.8860	3.8860	3.8861	3.8862	3.8862	3.8863	3.8863	3.8864	3.8864	
8 20	3.8865	3.8865	3.8866	3.8867	3.8867	3.8868	3.8868	3.8869	3.8869	3.8870	
8 30	3.8871	3.8871	3.8872	3.8872	3.8873	3.8873	3.8874	3.8874	3.8875	3.8876	
8 40	3.8876	3.8877	3.8877	3.8878	3.8878	3.8879	3.8880	3.8880	3.8881	3.8881	
8 50	3.8882	3.8882	3.8883	3.8883	3.8884	3.8885	3.8885	3.8886	3.8886	3.8887	
2 9 0	3.8887	3.8888	3.8889	3.8889	3.8890	3.8890	3.8891	3.8892	3.8892	3.8893	
9 10	3.8893	3.8894	3.8894	3.8895	3.8895	3.8896	3.8896	3.8897	3.8897	3.8898	
9 20	3.8899	3.8899	3.8900	3.8900	3.8901	3.8901	3.8902	3.8903	3.8903	3.8904	
9 30	3.8904	3.8905	3.8905	3.8906	3.8906	3.8907	3.8908	3.8908	3.8909	3.8909	
9 40	3.8910	3.8910	3.8911	3.8911	3.8912	3.8912	3.8913	3.8914	3.8914	3.8915	
9 50	3.8915	3.8916	3.8916	3.8917	3.8918	3.8918	3.8919	3.8919	3.8920	3.8920	

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
ARC.	0	1	2	3	4	5	6	7	8	9
$2^h 10^m 0^s$	3.8921	3.8922	3.8922	3.8923	3.8923	3.8924	3.8924	3.8925	3.8925	3.8926
10 10	3.8927	3.8927	3.8928	3.8928	3.8929	3.8929	3.8930	3.8930	3.8931	3.8932
10 20	3.8932	3.8933	3.8933	3.8934	3.8934	3.8935	3.8935	3.8936	3.8937	3.8937
10 30	3.8938	3.8938	3.8939	3.8939	3.8940	3.8940	3.8941	3.8941	3.8942	3.8943
10 40	3.8943	3.8944	3.8944	3.8945	3.8945	3.8946	3.8946	3.8947	3.8948	3.8948
10 50	3.8949	3.8949	3.8950	3.8950	3.8951	3.8951	3.8952	3.8953	3.8953	3.8954
2 11 0	3.8954	3.8955	3.8955	3.8956	3.8956	3.8957	3.8958	3.8958	3.8959	3.8959
11 10	3.8960	3.8960	3.8961	3.8961	3.8962	3.8963	3.8963	3.8964	3.8964	3.8965
11 20	3.8965	3.8966	3.8966	3.8967	3.8967	3.8968	3.8969	3.8969	3.8970	3.8970
11 30	3.8971	3.8971	3.8972	3.8972	3.8973	3.8974	3.8974	3.8975	3.8975	3.8976
11 40	3.8976	3.8977	3.8977	3.8978	3.8978	3.8979	3.8980	3.8980	3.8981	3.8981
11 50	3.8982	3.8982	3.8983	3.8983	3.8984	3.8985	3.8985	3.8986	3.8986	3.8987
2 12 0	3.8987	3.8988	3.8988	3.8989	3.8989	3.8990	3.8991	3.8991	3.8992	3.8992
12 10	3.8993	3.8993	3.8994	3.8994	3.8995	3.8995	3.8996	3.8997	3.8997	3.8998
12 20	3.8998	3.8999	3.8999	3.9000	3.9000	3.9001	3.9001	3.9002	3.9003	3.9003
12 30	3.9004	3.9004	3.9005	3.9005	3.9006	3.9006	3.9007	3.9007	3.9008	3.9009
12 40	3.9009	3.9010	3.9010	3.9011	3.9011	3.9012	3.9012	3.9013	3.9013	3.9014
12 50	3.9015	3.9015	3.9016	3.9016	3.9017	3.9017	3.9018	3.9018	3.9019	3.9019
2 13 0	3.9020	3.9021	3.9021	3.9022	3.9022	3.9023	3.9023	3.9024	3.9024	3.9025
13 10	3.9025	3.9026	3.9027	3.9027	3.9028	3.9028	3.9029	3.9029	3.9030	3.9030
13 20	3.9031	3.9031	3.9032	3.9033	3.9033	3.9034	3.9034	3.9035	3.9035	3.9036
13 30	3.9036	3.9037	3.9037	3.9038	3.9038	3.9039	3.9040	3.9040	3.9041	3.9041
13 40	3.9042	3.9042	3.9043	3.9043	3.9044	3.9044	3.9045	3.9046	3.9046	3.9047
13 50	3.9047	3.9048	3.9048	3.9049	3.9049	3.9050	3.9050	3.9051	3.9051	3.9052
2 14 0	3.9053	3.9053	3.9054	3.9054	3.9055	3.9055	3.9056	3.9056	3.9057	3.9057
14 10	3.9058	3.9058	3.9059	3.9059	3.9060	3.9061	3.9061	3.9062	3.9062	3.9063
14 20	3.9063	3.9064	3.9064	3.9065	3.9066	3.9066	3.9067	3.9067	3.9068	3.9068
14 30	3.9069	3.9069	3.9070	3.9070	3.9071	3.9071	3.9072	3.9073	3.9073	3.9074
14 40	3.9074	3.9075	3.9075	3.9076	3.9076	3.9077	3.9077	3.9078	3.9078	3.9079
14 50	3.9079	3.9080	3.9081	3.9081	3.9082	3.9082	3.9083	3.9083	3.9084	3.9084
2 15 0	3.9085	3.9085	3.9086	3.9086	3.9087	3.9088	3.9088	3.9089	3.9089	3.9090
15 10	3.9090	3.9091	3.9091	3.9092	3.9092	3.9093	3.9093	3.9094	3.9094	3.9095
15 20	3.9096	3.9096	3.9097	3.9097	3.9098	3.9098	3.9099	3.9099	3.9100	3.9100
15 30	3.9101	3.9101	3.9102	3.9103	3.9103	3.9104	3.9104	3.9105	3.9105	3.9106
15 40	3.9106	3.9107	3.9107	3.9108	3.9108	3.9109	3.9109	3.9110	3.9111	3.9111
15 50	3.9112	3.9112	3.9113	3.9113	3.9114	3.9114	3.9115	3.9115	3.9116	3.9116
2 16 0	3.9117	3.9117	3.9118	3.9118	3.9119	3.9120	3.9120	3.9121	3.9121	3.9122
16 10	3.9122	3.9123	3.9123	3.9124	3.9124	3.9125	3.9125	3.9126	3.9126	3.9127
16 20	3.9128	3.9128	3.9129	3.9129	3.9130	3.9130	3.9131	3.9131	3.9132	3.9132
16 30	3.9133	3.9133	3.9134	3.9134	3.9135	3.9135	3.9136	3.9137	3.9137	3.9138
16 40	3.9138	3.9139	3.9139	3.9140	3.9140	3.9141	3.9141	3.9142	3.9142	3.9143
16 50	3.9143	3.9144	3.9144	3.9145	3.9146	3.9146	3.9147	3.9147	3.9148	3.9148
2 17 0	3.9149	3.9149	3.9150	3.9150	3.9151	3.9151	3.9152	3.9152	3.9153	3.9153
17 10	3.9154	3.9155	3.9155	3.9156	3.9156	3.9157	3.9157	3.9158	3.9158	3.9159
17 20	3.9159	3.9160	3.9160	3.9161	3.9161	3.9162	3.9162	3.9163	3.9163	3.9164
17 30	3.9165	3.9165	3.9166	3.9166	3.9167	3.9167	3.9168	3.9168	3.9169	3.9169
17 40	3.9170	3.9170	3.9171	3.9171	3.9172	3.9172	3.9173	3.9173	3.9174	3.9175
17 50	3.9175	3.9176	3.9176	3.9177	3.9177	3.9178	3.9178	3.9179	3.9179	3.9180
2 18 0	3.9180	3.9181	3.9181	3.9182	3.9182	3.9183	3.9183	3.9184	3.9184	3.9185
18 10	3.9186	3.9186	3.9187	3.9187	3.9188	3.9188	3.9189	3.9189	3.9190	3.9190
18 20	3.9191	3.9191	3.9192	3.9192	3.9193	3.9193	3.9194	3.9194	3.9195	3.9195
18 30	3.9196	3.9197	3.9197	3.9198	3.9198	3.9199	3.9199	3.9200	3.9200	3.9201
18 40	3.9201	3.9202	3.9202	3.9203	3.9203	3.9204	3.9204	3.9205	3.9205	3.9206
18 50	3.9206	3.9207	3.9207	3.9208	3.9209	3.9209	3.9210	3.9210	3.9211	3.9211
2 19 0	3.9212	3.9212	3.9213	3.9213	3.9214	3.9214	3.9215	3.9215	3.9216	3.9216
19 10	3.9217	3.9217	3.9218	3.9218	3.9219	3.9219	3.9220	3.9221	3.9221	3.9222
19 20	3.9222	3.9223	3.9223	3.9224	3.9224	3.9225	3.9225	3.9226	3.9226	3.9227
19 30	3.9227	3.9228	3.9228	3.9229	3.9229	3.9230	3.9230	3.9231	3.9231	3.9232
19 40	3.9232	3.9233	3.9233	3.9234	3.9235	3.9235	3.9236	3.9236	3.9237	3.9237
19 50	3.9238	3.9238	3.9239	3.9239	3.9240	3.9240	3.9241	3.9241	3.9242	3.9242

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
ARC.	0	1	2	3	4	5	6	7	8	9
20 0	3.9243	3.9243	3.9244	3.9244	3.9245	3.9245	3.9246	3.9246	3.9247	3.9247
20 10	3.9248	3.9248	3.9249	3.9250	3.9250	3.9251	3.9251	3.9252	3.9252	3.9253
20 20	3.9253	3.9254	3.9254	3.9255	3.9255	3.9256	3.9256	3.9257	3.9257	3.9258
20 30	3.9258	3.9259	3.9259	3.9260	3.9260	3.9261	3.9261	3.9262	3.9262	3.9263
20 40	3.9263	3.9264	3.9264	3.9265	3.9265	3.9266	3.9267	3.9267	3.9268	3.9268
20 50	3.9269	3.9269	3.9270	3.9270	3.9271	3.9271	3.9272	3.9272	3.9273	3.9273
21 0	3.9274	3.9274	3.9275	3.9275	3.9276	3.9276	3.9277	3.9277	3.9278	3.9278
21 10	3.9279	3.9279	3.9280	3.9280	3.9281	3.9281	3.9282	3.9282	3.9283	3.9283
21 20	3.9284	3.9284	3.9285	3.9285	3.9286	3.9287	3.9287	3.9288	3.9288	3.9289
21 30	3.9289	3.9290	3.9290	3.9291	3.9291	3.9292	3.9292	3.9293	3.9293	3.9294
21 40	3.9294	3.9295	3.9295	3.9296	3.9296	3.9297	3.9297	3.9298	3.9298	3.9299
21 50	3.9299	3.9300	3.9300	3.9301	3.9301	3.9302	3.9302	3.9303	3.9303	3.9304
22 0	3.9304	3.9305	3.9305	3.9306	3.9306	3.9307	3.9307	3.9308	3.9308	3.9309
22 10	3.9309	3.9310	3.9311	3.9311	3.9312	3.9312	3.9313	3.9313	3.9314	3.9314
22 20	3.9315	3.9315	3.9316	3.9316	3.9317	3.9317	3.9318	3.9318	3.9319	3.9319
22 30	3.9320	3.9320	3.9321	3.9321	3.9322	3.9322	3.9323	3.9323	3.9324	3.9324
22 40	3.9325	3.9325	3.9326	3.9326	3.9327	3.9327	3.9328	3.9328	3.9329	3.9329
22 50	3.9330	3.9330	3.9331	3.9331	3.9332	3.9332	3.9333	3.9333	3.9334	3.9334
23 0	3.9335	3.9335	3.9336	3.9336	3.9337	3.9337	3.9338	3.9338	3.9339	3.9339
23 10	3.9340	3.9340	3.9341	3.9341	3.9342	3.9342	3.9343	3.9343	3.9344	3.9344
23 20	3.9345	3.9345	3.9346	3.9346	3.9347	3.9348	3.9348	3.9349	3.9349	3.9350
23 30	3.9350	3.9351	3.9351	3.9352	3.9352	3.9353	3.9353	3.9354	3.9354	3.9355
23 40	3.9355	3.9356	3.9356	3.9357	3.9357	3.9358	3.9358	3.9359	3.9359	3.9360
23 50	3.9360	3.9361	3.9361	3.9362	3.9362	3.9363	3.9363	3.9364	3.9364	3.9365
24 0	3.9365	3.9366	3.9366	3.9367	3.9367	3.9368	3.9368	3.9369	3.9369	3.9370
24 10	3.9370	3.9371	3.9371	3.9372	3.9372	3.9373	3.9373	3.9374	3.9374	3.9375
24 20	3.9375	3.9376	3.9376	3.9377	3.9377	3.9378	3.9378	3.9379	3.9379	3.9380
24 30	3.9380	3.9381	3.9381	3.9382	3.9382	3.9383	3.9383	3.9384	3.9384	3.9385
24 40	3.9385	3.9386	3.9386	3.9387	3.9387	3.9388	3.9388	3.9389	3.9389	3.9390
24 50	3.9390	3.9391	3.9391	3.9392	3.9392	3.9393	3.9393	3.9394	3.9394	3.9395
25 0	3.9395	3.9396	3.9396	3.9397	3.9397	3.9398	3.9398	3.9399	3.9399	3.9400
25 10	3.9400	3.9401	3.9401	3.9402	3.9402	3.9403	3.9403	3.9404	3.9404	3.9405
25 20	3.9405	3.9406	3.9406	3.9407	3.9407	3.9408	3.9408	3.9409	3.9409	3.9410
25 30	3.9410	3.9411	3.9411	3.9412	3.9412	3.9413	3.9413	3.9414	3.9414	3.9415
25 40	3.9415	3.9416	3.9416	3.9417	3.9417	3.9418	3.9418	3.9419	3.9419	3.9420
25 50	3.9420	3.9421	3.9421	3.9422	3.9422	3.9423	3.9423	3.9424	3.9424	3.9425
26 0	3.9425	3.9426	3.9426	3.9427	3.9427	3.9428	3.9428	3.9429	3.9429	3.9430
26 10	3.9430	3.9430	3.9431	3.9431	3.9432	3.9432	3.9433	3.9433	3.9434	3.9434
26 20	3.9435	3.9435	3.9436	3.9436	3.9437	3.9437	3.9438	3.9438	3.9439	3.9439
26 30	3.9440	3.9440	3.9441	3.9441	3.9442	3.9442	3.9443	3.9443	3.9444	3.9444
26 40	3.9445	3.9445	3.9446	3.9446	3.9447	3.9447	3.9448	3.9448	3.9449	3.9449
26 50	3.9450	3.9450	3.9451	3.9451	3.9452	3.9452	3.9453	3.9453	3.9454	3.9454
27 0	3.9455	3.9455	3.9456	3.9456	3.9457	3.9457	3.9458	3.9458	3.9459	3.9459
27 10	3.9460	3.9460	3.9461	3.9461	3.9462	3.9462	3.9463	3.9463	3.9464	3.9464
27 20	3.9465	3.9465	3.9466	3.9466	3.9467	3.9467	3.9468	3.9468	3.9469	3.9469
27 30	3.9469	3.9470	3.9470	3.9471	3.9471	3.9472	3.9472	3.9473	3.9473	3.9474
27 40	3.9474	3.9475	3.9475	3.9476	3.9476	3.9477	3.9477	3.9478	3.9478	3.9479
27 50	3.9479	3.9480	3.9480	3.9481	3.9481	3.9482	3.9482	3.9483	3.9483	3.9484
28 0	3.9484	3.9485	3.9485	3.9486	3.9486	3.9487	3.9487	3.9488	3.9488	3.9489
28 10	3.9489	3.9490	3.9490	3.9490	3.9491	3.9491	3.9492	3.9492	3.9493	3.9493
28 20	3.9494	3.9494	3.9495	3.9495	3.9496	3.9496	3.9497	3.9497	3.9498	3.9498
28 30	3.9499	3.9499	3.9500	3.9500	3.9501	3.9501	3.9502	3.9502	3.9503	3.9503
28 40	3.9504	3.9504	3.9505	3.9505	3.9506	3.9506	3.9507	3.9507	3.9508	3.9508
28 50	3.9509	3.9509	3.9509	3.9510	3.9510	3.9511	3.9511	3.9512	3.9512	3.9513
29 0	3.9513	3.9514	3.9514	3.9515	3.9515	3.9516	3.9516	3.9517	3.9517	3.9518
29 10	3.9518	3.9519	3.9519	3.9520	3.9520	3.9521	3.9521	3.9522	3.9522	3.9523
29 20	3.9523	3.9524	3.9524	3.9525	3.9525	3.9526	3.9526	3.9527	3.9527	3.9528
29 30	3.9528	3.9528	3.9529	3.9529	3.9530	3.9530	3.9531	3.9531	3.9532	3.9532
29 40	3.9533	3.9533	3.9534	3.9534	3.9535	3.9535	3.9536	3.9536	3.9537	3.9537
29 50	3.9538	3.9538	3.9539	3.9539	3.9540	3.9540	3.9541	3.9541	3.9542	3.9542

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
29 30 0	3.9542	3.9543	3.9543	3.9544	3.9544	3.9545	3.9545	3.9546	3.9546	3.9547
30 10	3.9547	3.9548	3.9548	3.9549	3.9549	3.9550	3.9550	3.9551	3.9551	3.9552
30 20	3.9552	3.9553	3.9553	3.9554	3.9554	3.9554	3.9555	3.9555	3.9556	3.9556
30 30	3.9557	3.9557	3.9558	3.9558	3.9559	3.9559	3.9560	3.9560	3.9561	3.9561
30 40	3.9562	3.9562	3.9563	3.9563	3.9564	3.9564	3.9565	3.9565	3.9566	3.9566
30 50	3.9566	3.9567	3.9567	3.9568	3.9568	3.9569	3.9569	3.9570	3.9570	3.9571
2 31 0	3.9571	3.9572	3.9572	3.9573	3.9573	3.9574	3.9574	3.9575	3.9575	3.9576
31 10	3.9576	3.9577	3.9577	3.9578	3.9578	3.9578	3.9579	3.9579	3.9580	3.9580
31 20	3.9581	3.9581	3.9582	3.9582	3.9583	3.9583	3.9584	3.9584	3.9585	3.9585
31 30	3.9586	3.9586	3.9587	3.9587	3.9588	3.9588	3.9589	3.9589	3.9589	3.9590
31 40	3.9590	3.9591	3.9591	3.9592	3.9592	3.9593	3.9593	3.9594	3.9594	3.9595
31 50	3.9595	3.9596	3.9596	3.9597	3.9597	3.9598	3.9598	3.9599	3.9599	3.9599
2 32 0	3.9600	3.9600	3.9601	3.9601	3.9602	3.9602	3.9603	3.9603	3.9604	3.9604
32 10	3.9605	3.9605	3.9606	3.9606	3.9607	3.9607	3.9608	3.9608	3.9609	3.9609
32 20	3.9609	3.9610	3.9610	3.9611	3.9611	3.9612	3.9612	3.9613	3.9613	3.9614
32 30	3.9614	3.9615	3.9615	3.9616	3.9616	3.9617	3.9617	3.9618	3.9618	3.9618
32 40	3.9619	3.9619	3.9620	3.9620	3.9621	3.9621	3.9622	3.9622	3.9623	3.9623
32 50	3.9624	3.9624	3.9625	3.9625	3.9626	3.9626	3.9627	3.9627	3.9628	3.9628
2 33 0	3.9628	3.9629	3.9629	3.9630	3.9630	3.9631	3.9631	3.9632	3.9632	3.9633
33 10	3.9633	3.9634	3.9634	3.9634	3.9635	3.9635	3.9636	3.9636	3.9637	3.9637
33 20	3.9638	3.9638	3.9639	3.9639	3.9640	3.9640	3.9641	3.9641	3.9642	3.9642
33 30	3.9642	3.9643	3.9643	3.9644	3.9644	3.9645	3.9645	3.9646	3.9646	3.9647
33 40	3.9647	3.9648	3.9648	3.9649	3.9649	3.9650	3.9650	3.9651	3.9651	3.9652
33 50	3.9652	3.9653	3.9653	3.9653	3.9654	3.9654	3.9655	3.9655	3.9656	3.9656
2 34 0	3.9657	3.9657	3.9658	3.9658	3.9658	3.9659	3.9659	3.9660	3.9660	3.9661
34 10	3.9661	3.9662	3.9662	3.9663	3.9663	3.9664	3.9664	3.9665	3.9665	3.9666
34 20	3.9666	3.9666	3.9667	3.9667	3.9668	3.9668	3.9669	3.9669	3.9670	3.9670
34 30	3.9671	3.9671	3.9672	3.9672	3.9672	3.9673	3.9673	3.9674	3.9674	3.9675
34 40	3.9675	3.9676	3.9676	3.9677	3.9677	3.9678	3.9678	3.9679	3.9679	3.9680
34 50	3.9680	3.9681	3.9681	3.9682	3.9682	3.9682	3.9683	3.9683	3.9684	3.9684
2 35 0	3.9685	3.9685	3.9686	3.9686	3.9687	3.9687	3.9688	3.9688	3.9689	3.9689
35 10	3.9689	3.9690	3.9690	3.9691	3.9691	3.9692	3.9692	3.9693	3.9693	3.9694
35 20	3.9694	3.9695	3.9695	3.9696	3.9696	3.9696	3.9697	3.9697	3.9698	3.9698
35 30	3.9699	3.9699	3.9700	3.9700	3.9701	3.9701	3.9702	3.9702	3.9703	3.9703
35 40	3.9703	3.9704	3.9704	3.9705	3.9705	3.9706	3.9706	3.9707	3.9707	3.9708
35 50	3.9708	3.9709	3.9709	3.9710	3.9710	3.9710	3.9711	3.9711	3.9712	3.9712
2 36 0	3.9713	3.9713	3.9714	3.9714	3.9715	3.9715	3.9716	3.9716	3.9716	3.9717
36 10	3.9717	3.9718	3.9718	3.9719	3.9719	3.9720	3.9720	3.9721	3.9721	3.9722
36 20	3.9722	3.9722	3.9723	3.9723	3.9724	3.9724	3.9725	3.9725	3.9726	3.9726
36 30	3.9727	3.9727	3.9728	3.9728	3.9729	3.9729	3.9729	3.9730	3.9730	3.9731
36 40	3.9731	3.9732	3.9732	3.9733	3.9733	3.9734	3.9734	3.9735	3.9735	3.9735
36 50	3.9736	3.9736	3.9737	3.9737	3.9738	3.9738	3.9739	3.9739	3.9740	3.9740
2 37 0	3.9741	3.9741	3.9741	3.9742	3.9742	3.9743	3.9743	3.9744	3.9744	3.9745
37 10	3.9745	3.9746	3.9746	3.9746	3.9747	3.9747	3.9748	3.9748	3.9749	3.9749
37 20	3.9750	3.9750	3.9751	3.9751	3.9752	3.9752	3.9752	3.9753	3.9753	3.9754
37 30	3.9754	3.9755	3.9755	3.9756	3.9756	3.9757	3.9757	3.9758	3.9758	3.9758
37 40	3.9759	3.9759	3.9760	3.9760	3.9761	3.9761	3.9762	3.9762	3.9763	3.9763
37 50	3.9763	3.9764	3.9764	3.9765	3.9765	3.9766	3.9766	3.9767	3.9767	3.9768
2 38 0	3.9768	3.9769	3.9769	3.9769	3.9770	3.9770	3.9771	3.9771	3.9772	3.9772
38 10	3.9773	3.9773	3.9774	3.9774	3.9774	3.9775	3.9775	3.9776	3.9776	3.9777
38 20	3.9777	3.9778	3.9778	3.9779	3.9779	3.9779	3.9780	3.9780	3.9781	3.9781
38 30	3.9782	3.9782	3.9783	3.9783	3.9784	3.9784	3.9785	3.9785	3.9785	3.9786
38 40	3.9786	3.9787	3.9787	3.9788	3.9788	3.9789	3.9789	3.9790	3.9790	3.9790
38 50	3.9791	3.9791	3.9792	3.9792	3.9793	3.9793	3.9794	3.9794	3.9795	3.9795
2 39 0	3.9795	3.9796	3.9796	3.9797	3.9797	3.9798	3.9798	3.9799	3.9799	3.9800
39 10	3.9800	3.9800	3.9801	3.9801	3.9802	3.9802	3.9803	3.9803	3.9804	3.9804
39 20	3.9805	3.9805	3.9805	3.9806	3.9806	3.9807	3.9807	3.9808	3.9808	3.9809
39 30	3.9809	3.9810	3.9810	3.9810	3.9811	3.9811	3.9812	3.9812	3.9813	3.9813
39 40	3.9814	3.9814	3.9815	3.9815	3.9815	3.9816	3.9816	3.9817	3.9817	3.9818
39 50	3.9818	3.9819	3.9819	3.9819	3.9820	3.9820	3.9821	3.9821	3.9822	3.9822

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$2^h 40^m 0^s$	3.9823	3.9823	3.9824	3.9824	3.9825	3.9825	3.9825	3.9826	3.9826	3.9827
40 10	3.9827	3.9828	3.9828	3.9829	3.9829	3.9829	3.9830	3.9830	3.9831	3.9831
40 20	3.9832	3.9832	3.9833	3.9833	3.9834	3.9834	3.9834	3.9835	3.9835	3.9836
40 30	3.9836	3.9837	3.9837	3.9838	3.9838	3.9839	3.9839	3.9839	3.9840	3.9840
40 40	3.9841	3.9841	3.9842	3.9842	3.9843	3.9843	3.9843	3.9844	3.9844	3.9845
40 50	3.9845	3.9846	3.9846	3.9847	3.9847	3.9848	3.9848	3.9848	3.9849	3.9849
2 41 0	3.9850	3.9850	3.9851	3.9851	3.9852	3.9852	3.9852	3.9853	3.9853	3.9854
41 10	3.9854	3.9855	3.9855	3.9856	3.9856	3.9857	3.9857	3.9857	3.9858	3.9858
41 20	3.9859	3.9859	3.9860	3.9860	3.9861	3.9861	3.9861	3.9862	3.9862	3.9863
41 30	3.9863	3.9864	3.9864	3.9865	3.9865	3.9866	3.9866	3.9866	3.9867	3.9867
41 40	3.9868	3.9868	3.9869	3.9869	3.9870	3.9870	3.9870	3.9871	3.9871	3.9872
41 50	3.9872	3.9873	3.9873	3.9874	3.9874	3.9874	3.9875	3.9875	3.9876	3.9876
2 42 0	3.9877	3.9877	3.9878	3.9878	3.9878	3.9879	3.9879	3.9880	3.9880	3.9881
42 10	3.9881	3.9882	3.9882	3.9883	3.9883	3.9883	3.9884	3.9884	3.9885	3.9885
42 20	3.9886	3.9886	3.9886	3.9887	3.9887	3.9888	3.9888	3.9889	3.9889	3.9890
42 30	3.9890	3.9890	3.9891	3.9891	3.9892	3.9892	3.9893	3.9893	3.9894	3.9894
42 40	3.9894	3.9895	3.9895	3.9896	3.9896	3.9897	3.9897	3.9898	3.9898	3.9898
42 50	3.9899	3.9899	3.9900	3.9900	3.9901	3.9901	3.9902	3.9902	3.9903	3.9903
2 43 0	3.9903	3.9904	3.9904	3.9905	3.9905	3.9906	3.9906	3.9906	3.9907	3.9907
43 10	3.9908	3.9908	3.9909	3.9909	3.9910	3.9910	3.9911	3.9911	3.9911	3.9912
43 20	3.9912	3.9913	3.9913	3.9914	3.9914	3.9914	3.9915	3.9915	3.9916	3.9916
43 30	3.9917	3.9917	3.9918	3.9918	3.9918	3.9919	3.9919	3.9920	3.9920	3.9921
43 40	3.9921	3.9922	3.9922	3.9922	3.9923	3.9923	3.9924	3.9924	3.9925	3.9925
43 50	3.9926	3.9926	3.9926	3.9927	3.9927	3.9928	3.9928	3.9929	3.9929	3.9930
2 44 0	3.9930	3.9930	3.9931	3.9931	3.9932	3.9932	3.9933	3.9933	3.9933	3.9934
44 10	3.9934	3.9935	3.9935	3.9936	3.9936	3.9937	3.9937	3.9937	3.9938	3.9938
44 20	3.9939	3.9939	3.9940	3.9940	3.9941	3.9941	3.9941	3.9942	3.9942	3.9943
44 30	3.9943	3.9944	3.9944	3.9944	3.9945	3.9945	3.9946	3.9946	3.9947	3.9947
44 40	3.9948	3.9948	3.9948	3.9949	3.9949	3.9950	3.9950	3.9951	3.9951	3.9952
44 50	3.9952	3.9952	3.9953	3.9953	3.9954	3.9954	3.9955	3.9955	3.9955	3.9956
2 45 0	3.9956	3.9957	3.9957	3.9958	3.9958	3.9959	3.9959	3.9959	3.9960	3.9960
45 10	3.9961	3.9961	3.9962	3.9962	3.9962	3.9963	3.9963	3.9964	3.9964	3.9965
45 20	3.9965	3.9966	3.9966	3.9966	3.9967	3.9967	3.9968	3.9968	3.9969	3.9969
45 30	3.9969	3.9970	3.9970	3.9971	3.9971	3.9972	3.9972	3.9973	3.9973	3.9973
45 40	3.9974	3.9974	3.9975	3.9975	3.9976	3.9976	3.9976	3.9977	3.9977	3.9978
45 50	3.9978	3.9979	3.9979	3.9980	3.9980	3.9980	3.9981	3.9981	3.9982	3.9982
2 46 0	3.9983	3.9983	3.9983	3.9984	3.9984	3.9985	3.9985	3.9986	3.9986	3.9987
46 10	3.9987	3.9987	3.9988	3.9988	3.9989	3.9989	3.9990	3.9990	3.9990	3.9991
46 20	3.9991	3.9992	3.9992	3.9993	3.9993	3.9993	3.9994	3.9994	3.9995	3.9995
46 30	3.9996	3.9996	3.9997	3.9997	3.9997	3.9998	3.9998	3.9999	3.9999	4.0000
46 40	4.0000	4.0000	4.0001	4.0001	4.0002	4.0002	4.0003	4.0003	4.0003	4.0004
46 50	4.0004	4.0005	4.0005	4.0006	4.0006	4.0007	4.0007	4.0007	4.0008	4.0008
2 47 0	4.0009	4.0009	4.0010	4.0010	4.0010	4.0011	4.0011	4.0012	4.0012	4.0013
47 10	4.0013	4.0013	4.0014	4.0014	4.0015	4.0015	4.0016	4.0016	4.0016	4.0017
47 20	4.0017	4.0018	4.0018	4.0019	4.0019	4.0019	4.0020	4.0020	4.0021	4.0021
47 30	4.0022	4.0022	4.0023	4.0023	4.0023	4.0024	4.0024	4.0025	4.0025	4.0026
47 40	4.0026	4.0026	4.0027	4.0027	4.0028	4.0028	4.0029	4.0029	4.0029	4.0030
47 50	4.0030	4.0031	4.0031	4.0032	4.0032	4.0032	4.0033	4.0033	4.0034	4.0034
2 48 0	4.0035	4.0035	4.0035	4.0036	4.0036	4.0037	4.0037	4.0038	4.0038	4.0038
48 10	4.0039	4.0039	4.0040	4.0040	4.0041	4.0041	4.0042	4.0042	4.0043	4.0043
48 20	4.0043	4.0044	4.0044	4.0045	4.0045	4.0045	4.0046	4.0046	4.0047	4.0047
48 30	4.0048	4.0048	4.0048	4.0049	4.0049	4.0050	4.0050	4.0051	4.0051	4.0051
48 40	4.0052	4.0052	4.0053	4.0053	4.0054	4.0054	4.0054	4.0055	4.0055	4.0056
48 50	4.0056	4.0057	4.0057	4.0057	4.0058	4.0058	4.0059	4.0059	4.0060	4.0060
2 49 0	4.0060	4.0061	4.0061	4.0062	4.0062	4.0063	4.0063	4.0063	4.0064	4.0064
49 10	4.0065	4.0065	4.0066	4.0066	4.0066	4.0067	4.0067	4.0068	4.0068	4.0069
49 20	4.0069	4.0069	4.0070	4.0070	4.0071	4.0071	4.0072	4.0072	4.0072	4.0073
49 30	4.0073	4.0074	4.0074	4.0074	4.0075	4.0075	4.0076	4.0076	4.0077	4.0077
49 40	4.0077	4.0078	4.0078	4.0079	4.0079	4.0080	4.0080	4.0080	4.0081	4.0081
49 50	4.0082	4.0082	4.0083	4.0083	4.0083	4.0084	4.0084	4.0085	4.0085	4.0086

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$2^h 50^m 0^s$	4.0086	4.0086	4.0087	4.0087	4.0088	4.0088	4.0089	4.0089	4.0089	4.0090
50 10	4.0090	4.0091	4.0091	4.0092	4.0092	4.0092	4.0093	4.0093	4.0094	4.0094
50 20	4.0095	4.0095	4.0095	4.0096	4.0096	4.0097	4.0097	4.0097	4.0098	4.0098
50 30	4.0099	4.0099	4.0100	4.0100	4.0100	4.0101	4.0101	4.0102	4.0102	4.0103
50 40	4.0103	4.0103	4.0104	4.0104	4.0105	4.0105	4.0106	4.0106	4.0106	4.0107
50 50	4.0107	4.0108	4.0108	4.0109	4.0109	4.0109	4.0110	4.0110	4.0111	4.0111
2 51 0	4.0111	4.0112	4.0112	4.0113	4.0113	4.0114	4.0114	4.0114	4.0115	4.0115
51 10	4.0116	4.0116	4.0117	4.0117	4.0117	4.0118	4.0118	4.0119	4.0119	4.0120
51 20	4.0120	4.0120	4.0121	4.0121	4.0122	4.0122	4.0122	4.0123	4.0123	4.0124
51 30	4.0124	4.0125	4.0125	4.0125	4.0126	4.0126	4.0127	4.0127	4.0128	4.0128
51 40	4.0128	4.0129	4.0129	4.0130	4.0130	4.0130	4.0131	4.0131	4.0132	4.0132
51 50	4.0133	4.0133	4.0133	4.0134	4.0134	4.0135	4.0135	4.0136	4.0136	4.0136
2 52 0	4.0137	4.0137	4.0138	4.0138	4.0138	4.0139	4.0139	4.0140	4.0140	4.0141
52 10	4.0141	4.0141	4.0142	4.0142	4.0143	4.0143	4.0144	4.0144	4.0144	4.0145
52 20	4.0145	4.0146	4.0146	4.0146	4.0147	4.0147	4.0148	4.0148	4.0149	4.0149
52 30	4.0149	4.0150	4.0150	4.0151	4.0151	4.0152	4.0152	4.0153	4.0153	4.0153
52 40	4.0154	4.0154	4.0154	4.0155	4.0155	4.0156	4.0156	4.0157	4.0157	4.0157
52 50	4.0158	4.0158	4.0159	4.0159	4.0159	4.0160	4.0160	4.0161	4.0161	4.0162
2 53 0	4.0162	4.0162	4.0163	4.0163	4.0164	4.0164	4.0164	4.0165	4.0165	4.0166
53 10	4.0166	4.0167	4.0167	4.0167	4.0168	4.0168	4.0169	4.0169	4.0169	4.0170
53 20	4.0170	4.0171	4.0171	4.0172	4.0172	4.0172	4.0173	4.0173	4.0174	4.0174
53 30	4.0175	4.0175	4.0175	4.0176	4.0176	4.0177	4.0177	4.0177	4.0178	4.0178
53 40	4.0179	4.0179	4.0180	4.0180	4.0180	4.0181	4.0181	4.0182	4.0182	4.0182
53 50	4.0183	4.0183	4.0184	4.0184	4.0185	4.0185	4.0185	4.0186	4.0186	4.0187
2 54 0	4.0187	4.0187	4.0188	4.0188	4.0189	4.0189	4.0190	4.0190	4.0190	4.0191
54 10	4.0191	4.0192	4.0192	4.0192	4.0193	4.0193	4.0194	4.0194	4.0194	4.0195
54 20	4.0195	4.0196	4.0196	4.0197	4.0197	4.0197	4.0198	4.0198	4.0199	4.0199
54 30	4.0199	4.0200	4.0200	4.0201	4.0201	4.0202	4.0202	4.0202	4.0203	4.0203
54 40	4.0204	4.0204	4.0204	4.0205	4.0205	4.0206	4.0206	4.0207	4.0207	4.0207
54 50	4.0208	4.0208	4.0209	4.0209	4.0209	4.0210	4.0210	4.0211	4.0211	4.0211
2 55 0	4.0212	4.0212	4.0213	4.0213	4.0214	4.0214	4.0214	4.0215	4.0215	4.0216
55 10	4.0216	4.0216	4.0217	4.0217	4.0218	4.0218	4.0219	4.0219	4.0219	4.0220
55 20	4.0220	4.0221	4.0221	4.0221	4.0222	4.0222	4.0223	4.0223	4.0223	4.0224
55 30	4.0224	4.0225	4.0225	4.0225	4.0226	4.0226	4.0227	4.0227	4.0228	4.0228
55 40	4.0228	4.0229	4.0229	4.0230	4.0230	4.0230	4.0231	4.0231	4.0232	4.0232
55 50	4.0233	4.0233	4.0233	4.0234	4.0234	4.0235	4.0235	4.0235	4.0236	4.0236
2 56 0	4.0237	4.0237	4.0237	4.0238	4.0238	4.0239	4.0239	4.0240	4.0240	4.0240
56 10	4.0241	4.0241	4.0242	4.0242	4.0242	4.0243	4.0243	4.0244	4.0244	4.0244
56 20	4.0245	4.0245	4.0246	4.0246	4.0246	4.0247	4.0247	4.0248	4.0248	4.0249
56 30	4.0249	4.0249	4.0250	4.0250	4.0251	4.0251	4.0251	4.0252	4.0252	4.0253
56 40	4.0253	4.0253	4.0254	4.0254	4.0255	4.0255	4.0256	4.0256	4.0256	4.0257
56 50	4.0257	4.0258	4.0258	4.0258	4.0259	4.0259	4.0260	4.0260	4.0260	4.0261
2 57 0	4.0261	4.0262	4.0262	4.0262	4.0263	4.0263	4.0264	4.0264	4.0265	4.0265
57 10	4.0265	4.0266	4.0266	4.0267	4.0267	4.0267	4.0268	4.0268	4.0269	4.0269
57 20	4.0269	4.0270	4.0270	4.0271	4.0271	4.0271	4.0272	4.0272	4.0273	4.0273
57 30	4.0273	4.0274	4.0274	4.0275	4.0275	4.0276	4.0276	4.0276	4.0277	4.0277
57 40	4.0278	4.0278	4.0278	4.0279	4.0279	4.0280	4.0280	4.0280	4.0281	4.0281
57 50	4.0282	4.0282	4.0282	4.0283	4.0283	4.0284	4.0284	4.0284	4.0285	4.0285
2 58 0	4.0286	4.0286	4.0287	4.0287	4.0287	4.0288	4.0288	4.0289	4.0289	4.0289
58 10	4.0290	4.0290	4.0291	4.0291	4.0292	4.0292	4.0293	4.0293	4.0293	4.0293
58 20	4.0294	4.0294	4.0295	4.0295	4.0295	4.0296	4.0296	4.0297	4.0297	4.0297
58 30	4.0298	4.0298	4.0299	4.0299	4.0300	4.0300	4.0300	4.0301	4.0301	4.0302
58 40	4.0302	4.0302	4.0303	4.0303	4.0304	4.0304	4.0304	4.0305	4.0305	4.0306
58 50	4.0306	4.0306	4.0307	4.0307	4.0308	4.0308	4.0308	4.0309	4.0309	4.0310
2 59 0	4.0310	4.0310	4.0311	4.0311	4.0312	4.0312	4.0312	4.0313	4.0313	4.0314
59 10	4.0314	4.0314	4.0315	4.0315	4.0316	4.0316	4.0317	4.0317	4.0317	4.0318
59 20	4.0318	4.0319	4.0319	4.0319	4.0320	4.0320	4.0321	4.0321	4.0321	4.0322
59 30	4.0322	4.0323	4.0323	4.0323	4.0324	4.0324	4.0325	4.0325	4.0325	4.0326
59 40	4.0326	4.0327	4.0327	4.0327	4.0328	4.0328	4.0329	4.0329	4.0329	4.0330
59 50	4.0330	4.0331	4.0331	4.0331	4.0332	4.0332	4.0333	4.0333	4.0333	4.0334

TABLE II.

TABLE SHOWING THE CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

Approximate Interval.		Difference of the Proportional Logarithms in the Ephemeris.																									
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 0	2 0	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14	14
1 10	1 50	1	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15	15
1 20	1 40	1	2	3	3	4	4	5	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16	16	16
1 30	1 30	1	2	3	3	4	4	5	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	17

Approximate Interval.		Difference of the Proportional Logarithms in the Ephemeris.																									
		54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	7	7	7
0 20	2 40	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	13
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17	18	18
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22	22	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25	25	26
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28	28	29
1 10	1 50	16	17	17	18	18	19	20	21	21	22	22	23	24	24	25	25	26	26	27	27	28	29	29	30	30	31
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	30	31	31	32	32
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31	32	33

Approximate Interval.		Difference of the Proportional Logarithms in the Ephemeris.													
		104	105	106	107	108	109	110	111	112	113	114	115	116	117
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8
0 20	2 40	13	13	13	14	14	14	14	14	15	15	15	15	15	16
0 30	2 30	18	18	19	19	19	20	20	20	21	21	21	21	22	22
0 40	2 20	22	23	23	24	24	25	25	25	26	26	27	27	28	28
0 50	2 10	26	26	27	27	28	28	29	29	29	30	30	31	31	32
1 0	2 0	29	29	30	30	31	31	32	32	33	33	34	34	35	35
1 10	1 50	31	31	32	32	33	34	34	35	35	36	37	37	38	38
1 20	1 40	32	33	33	34	34	35	35	36	37	38	39	39	40	40
1 30	1 30	32	33	34	34	35	35	36	37	38	39	39	40	41	41

The Correction is to be added to the approximate Greenwich Time when the Proportional Logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE III. SIDEREAL INTO MEAN SOLAR TIME.

Sidereal.	0 ^h .	1 ^h .	2 ^h .	3 ^h .	4 ^h .	5 ^h .	6 ^h .	7 ^h .	For Seconds.
m.	m.	m.	m.	m.	m.	m.	m.	m.	s.
0	0 00.000	0 09.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 08.807	1 0.003
1	0 00.164	0 09.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 08.971	2 .005
2	0 00.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 09.135	3 .008
3	0 00.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 09.298	4 .011
4	0 00.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 09.462	5 .014
5	0 00.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 09.626	6 .016
6	0 00.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.966	1 09.790	7 .019
7	0 01.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 00.124	1 09.954	8 .022
8	0 01.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 00.288	1 10.118	9 .025
9	0 01.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 00.452	1 10.281	10 .027
10	0 01.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 00.616	1 10.445	11 .030
11	0 01.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 00.779	1 10.609	12 .033
12	0 01.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 00.943	1 10.773	13 .035
13	0 02.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 01.107	1 10.937	14 .038
14	0 02.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 01.271	1 11.100	15 .041
15	0 02.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 01.435	1 11.264	16 .044
16	0 02.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 01.599	1 11.428	17 .046
17	0 02.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 01.762	1 11.592	18 .049
18	0 02.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 01.926	1 11.756	19 .052
19	0 03.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 02.090	1 11.920	20 .055
20	0 03.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 02.254	1 12.083	21 .057
21	0 03.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 02.418	1 12.247	22 .060
22	0 03.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 02.582	1 12.411	23 .063
23	0 03.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 02.745	1 12.575	24 .066
24	0 03.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 02.909	1 12.739	25 .068
25	0 04.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 03.073	1 12.903	26 .071
26	0 04.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 03.237	1 13.066	27 .074
27	0 04.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 03.401	1 13.230	28 .076
28	0 04.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 03.564	1 13.394	29 .079
29	0 04.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 03.728	1 13.558	30 .082
30	0 04.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 03.892	1 13.722	31 .085
31	0 05.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 04.056	1 13.886	32 .087
32	0 05.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 04.220	1 14.049	33 .090
33	0 05.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 04.384	1 14.213	34 .093
34	0 05.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 04.547	1 14.377	35 .096
35	0 05.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 04.711	1 14.541	36 .098
36	0 05.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 04.875	1 14.705	37 .101
37	0 06.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 05.039	1 14.868	38 .104
38	0 06.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 05.203	1 15.032	39 .106
39	0 06.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 05.367	1 15.196	40 .109
40	0 06.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 05.530	1 15.360	41 .112
41	0 06.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 05.694	1 15.524	42 .115
42	0 06.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 05.858	1 15.688	43 .117
43	0 07.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 06.022	1 15.851	44 .120
44	0 07.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 06.186	1 16.015	45 .123
45	0 07.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 06.350	1 16.179	46 .126
46	0 07.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 06.513	1 16.343	47 .128
47	0 07.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 06.677	1 16.507	48 .131
48	0 07.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 06.841	1 16.671	49 .134
49	0 08.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 07.005	1 16.834	50 .137
50	0 08.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 07.169	1 16.998	51 .139
51	0 08.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 07.332	1 17.162	52 .142
52	0 08.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 07.496	1 17.326	53 .145
53	0 08.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 07.660	1 17.490	54 .147
54	0 08.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 07.824	1 17.654	55 .150
55	0 09.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 07.988	1 17.817	56 .153
56	0 09.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 08.152	1 17.981	57 .156
57	0 09.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 08.315	1 18.145	58 .158
58	0 09.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 08.479	1 18.309	59 .161
59	0 09.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 08.643	1 18.473	

TABLE III. SIDEREAL INTO MEAN SOLAR TIME.

Sidereal	8 h.	9 h.	10 h.	11 h.	12 h.	13 h.	14 h.	15 h.	For Seconds.
m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	s. s.
0	18.636	28.466	38.296	48.125	57.955	07.784	17.614	27.443	1 0.003
1	18.800	28.630	38.459	48.289	58.119	07.948	17.778	27.607	2 .005
2	18.964	28.794	38.623	48.453	58.282	08.112	17.941	27.771	3 .008
3	19.128	28.958	38.787	48.617	58.446	08.276	18.105	27.935	4 .011
4	19.292	29.121	38.951	48.780	58.610	08.440	18.269	28.099	5 .014
5	19.456	29.285	39.115	48.944	58.774	08.603	18.433	28.263	6 .016
6	19.619	29.449	39.279	49.108	58.938	08.767	18.597	28.426	7 .019
7	19.783	29.613	39.442	49.272	59.101	08.931	18.761	28.590	8 .022
8	19.947	29.777	39.606	49.436	59.265	09.095	18.924	28.754	9 .025
9	20.111	29.940	39.770	49.600	59.429	09.259	19.088	28.918	10 .027
10	20.275	30.104	39.934	49.763	59.593	09.423	19.252	29.082	11 .030
11	20.439	30.268	40.098	49.927	59.757	09.586	19.416	29.245	12 .033
12	20.602	30.432	40.261	50.091	59.921	09.750	19.580	29.409	13 .035
13	20.766	30.596	40.425	50.255	60.084	09.914	19.744	29.573	14 .038
14	20.930	30.760	40.589	50.419	60.248	10.078	19.907	29.737	15 .041
15	21.094	30.923	40.753	50.583	60.412	10.242	20.071	29.901	16 .044
16	21.258	31.087	40.917	50.746	60.576	10.405	20.235	30.065	17 .046
17	21.422	31.251	41.081	50.910	60.740	10.569	20.399	30.228	18 .049
18	21.585	31.415	41.244	51.074	60.904	10.733	20.563	30.392	19 .052
19	21.749	31.579	41.408	51.238	61.067	10.897	20.727	30.556	20 .055
20	21.913	31.743	41.572	51.402	61.231	11.061	20.890	30.720	21 .057
21	22.077	31.906	41.736	51.565	61.395	11.225	21.054	30.884	22 .060
22	22.241	32.070	41.900	51.729	61.559	11.388	21.218	31.048	23 .063
23	22.404	32.234	42.064	51.893	61.723	11.552	21.382	31.211	24 .066
24	22.568	32.398	42.227	52.057	61.887	11.716	21.546	31.375	25 .068
25	22.732	32.562	42.391	52.221	62.050	11.880	21.709	31.539	26 .071
26	22.896	32.726	42.555	52.385	62.214	12.044	21.873	31.703	27 .074
27	23.060	32.889	42.719	52.548	62.378	12.208	22.037	31.867	28 .076
28	23.224	33.053	42.883	52.712	62.542	12.371	22.201	32.031	29 .079
29	23.387	33.217	43.047	52.876	62.706	12.535	22.365	32.194	30 .082
30	23.551	33.381	43.210	53.040	62.869	12.699	22.529	32.358	31 .085
31	23.715	33.545	43.374	53.204	63.033	12.863	22.692	32.522	32 .087
32	23.879	33.708	43.538	53.368	63.197	13.027	22.856	32.686	33 .090
33	24.043	33.872	43.702	53.531	63.361	13.191	23.020	32.850	34 .093
34	24.207	34.036	43.866	53.695	63.525	13.354	23.184	33.013	35 .096
35	24.370	34.200	44.029	53.859	63.689	13.518	23.348	33.177	36 .098
36	24.534	34.364	44.193	54.023	63.852	13.682	23.512	33.341	37 .101
37	24.698	34.528	44.357	54.187	64.016	13.846	23.675	33.505	38 .104
38	24.862	34.691	44.521	54.351	64.180	14.010	23.839	33.669	39 .106
39	25.026	34.855	44.685	54.514	64.344	14.173	24.003	33.833	40 .109
40	25.190	35.019	44.849	54.678	64.508	14.337	24.167	33.996	41 .112
41	25.353	35.183	45.012	54.842	64.672	14.501	24.331	34.160	42 .115
42	25.517	35.347	45.176	55.006	64.835	14.665	24.495	34.324	43 .117
43	25.681	35.511	45.340	55.170	64.999	14.829	24.658	34.488	44 .120
44	25.845	35.674	45.504	55.333	65.163	14.993	24.822	34.652	45 .123
45	26.009	35.838	45.668	55.497	65.327	15.156	24.986	34.816	46 .126
46	26.172	36.002	45.832	55.661	65.491	15.320	25.150	34.979	47 .128
47	26.336	36.166	45.995	55.825	65.655	15.484	25.314	35.143	48 .131
48	26.500	36.330	46.159	55.989	65.818	15.648	25.477	35.307	49 .134
49	26.664	36.493	46.323	56.153	65.982	15.812	25.641	35.471	50 .137
50	26.828	36.657	46.487	56.316	66.146	15.976	25.805	35.635	51 .139
51	26.992	36.821	46.651	56.480	66.310	16.139	25.969	35.798	52 .142
52	27.155	36.985	46.815	56.644	66.474	16.303	26.133	35.962	53 .145
53	27.319	37.149	46.978	56.808	66.637	16.467	26.297	36.126	54 .147
54	27.483	37.313	47.142	56.972	66.801	16.631	26.460	36.290	55 .150
55	27.647	37.476	47.306	57.136	66.965	16.795	26.624	36.454	56 .153
56	27.811	37.640	47.470	57.299	67.129	16.959	26.788	36.618	57 .156
57	27.975	37.804	47.634	57.463	67.293	17.122	26.952	36.781	58 .158
58	28.139	37.968	47.797	57.627	67.457	17.286	27.116	36.945	59 .161
59	28.302	38.132	47.961	57.791	67.620	17.450	27.280	37.109	

TABLE III. SIDEREAL INTO MEAN SOLAR TIME.

Sidereal	16 ^h .	17 ^h .	18 ^h .	19 ^h .	20 ^h .	21 ^h .	22 ^h .	23 ^h .	For Seconds.
m.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	s.
0	2 37.273	2 47.102	2 56.932	3 06.762	3 16.591	3 26.421	3 36.250	3 46.080	1 .003
1	2 37.437	2 47.266	2 57.096	3 06.925	3 16.755	3 26.585	3 36.414	3 46.244	2 .005
2	2 37.601	2 47.430	2 57.260	3 07.089	3 16.919	3 26.748	3 36.578	3 46.407	3 .008
3	2 37.764	2 47.594	2 57.424	3 07.253	3 17.083	3 26.912	3 36.742	3 46.571	4 .011
4	2 37.928	2 47.758	2 57.587	3 07.417	3 17.246	3 27.076	3 36.906	3 46.735	5 .014
5	2 38.092	2 47.922	2 57.751	3 07.581	3 17.410	3 27.240	3 37.069	3 46.899	6 .016
6	2 38.256	2 48.085	2 57.915	3 07.745	3 17.574	3 27.404	3 37.233	3 47.063	7 .019
7	2 38.420	2 48.249	2 58.079	3 07.908	3 17.738	3 27.568	3 37.397	3 47.227	8 .022
8	2 38.584	2 48.413	2 58.243	3 08.072	3 17.902	3 27.731	3 37.561	3 47.390	9 .025
9	2 38.747	2 48.577	2 58.406	3 08.236	3 18.066	3 27.895	3 37.725	3 47.554	10 .027
10	2 38.911	2 48.741	2 58.570	3 08.400	3 18.229	3 28.059	3 37.889	3 47.718	11 .030
11	2 39.075	2 48.905	2 58.734	3 08.564	3 18.393	3 28.223	3 38.052	3 47.882	12 .033
12	2 39.239	2 49.068	2 58.898	3 08.728	3 18.557	3 28.387	3 38.216	3 48.046	13 .035
13	2 39.403	2 49.232	2 59.062	3 08.891	3 18.721	3 28.550	3 38.380	3 48.210	14 .038
14	2 39.566	2 49.396	2 59.226	3 09.055	3 18.885	3 28.714	3 38.544	3 48.373	15 .041
15	2 39.730	2 49.560	2 59.389	3 09.219	3 19.049	3 28.878	3 38.708	3 48.537	16 .044
16	2 39.894	2 49.724	2 59.553	3 09.383	3 19.212	3 29.042	3 38.871	3 48.701	17 .046
17	2 40.058	2 49.888	2 59.717	3 09.547	3 19.376	3 29.206	3 39.035	3 48.865	18 .049
18	2 40.222	2 50.051	2 59.881	3 09.710	3 19.540	3 29.370	3 39.199	3 49.029	19 .052
19	2 40.386	2 50.215	3 00.045	3 09.874	3 19.704	3 29.533	3 39.363	3 49.193	20 .055
20	2 40.549	2 50.379	3 00.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	21 .057
21	2 40.713	2 50.543	3 00.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	22 .060
22	2 40.877	2 50.707	3 00.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	23 .063
23	2 41.041	2 50.870	3 00.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	24 .066
24	2 41.205	2 51.034	3 00.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	25 .068
25	2 41.369	2 51.198	3 01.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	26 .071
26	2 41.532	2 51.362	3 01.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	27 .074
27	2 41.696	2 51.526	3 01.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	28 .076
28	2 41.860	2 51.690	3 01.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	29 .079
29	2 42.024	2 51.853	3 01.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	30 .082
30	2 42.188	2 52.017	3 01.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	31 .085
31	2 42.352	2 52.181	3 02.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	32 .087
32	2 42.515	2 52.345	3 02.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	33 .090
33	2 42.679	2 52.509	3 02.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	34 .093
34	2 42.843	2 52.673	3 02.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	35 .096
35	2 43.007	2 52.836	3 02.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	36 .098
36	2 43.171	2 53.000	3 02.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	37 .101
37	2 43.334	2 53.164	3 02.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	38 .104
38	2 43.498	2 53.328	3 03.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	39 .106
39	2 43.662	2 53.492	3 03.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	40 .109
40	2 43.826	2 53.656	3 03.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	41 .112
41	2 43.990	2 53.819	3 03.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	42 .115
42	2 44.154	2 53.983	3 03.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	43 .117
43	2 44.317	2 54.147	3 03.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	44 .120
44	2 44.481	2 54.311	3 04.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	45 .123
45	2 44.645	2 54.475	3 04.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	46 .126
46	2 44.809	2 54.638	3 04.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	47 .128
47	2 44.973	2 54.802	3 04.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	48 .131
48	2 45.137	2 54.966	3 04.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	49 .134
49	2 45.300	2 55.130	3 04.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	50 .137
50	2 45.464	2 55.294	3 05.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	51 .139
51	2 45.628	2 55.458	3 05.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	52 .142
52	2 45.792	2 55.621	3 05.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	53 .145
53	2 45.956	2 55.785	3 05.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	54 .147
54	2 46.120	2 55.949	3 05.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	55 .150
55	2 46.283	2 56.113	3 05.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	56 .153
56	2 46.447	2 56.277	3 06.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	57 .156
57	2 46.611	2 56.441	3 06.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	58 .158
58	2 46.775	2 56.604	3 06.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	59 .161
59	2 46.939	2 56.768	3 06.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	

TABLE III. MEAN SOLAR INTO SIDEREAL TIME

Mean Solar.	0 h.	1 h.	2 h.	3 h.	4 h.	5 h.	6 h.	7 h.	For Seconds.
m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	s. s.
0	00.0000	0 09.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 08.995	
1	0 00.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 09.160	1 0.003
2	0 00.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 09.324	2 .005
3	0 00.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 09.488	3 .008
4	0 00.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 09.652	4 .011
5	0 00.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 09.817	5 .014
6	0 00.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 00.124	1 09.981	6 .016
7	0 01.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 00.289	1 10.145	7 .019
8	0 01.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 00.453	1 10.310	8 .022
9	0 01.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 00.617	1 10.474	9 .025
10	0 01.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 00.782	1 10.638	10 .027
11	0 01.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 00.946	1 10.802	11 .030
12	0 01.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 01.110	1 10.967	12 .033
13	0 02.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 01.274	1 11.131	13 .036
14	0 02.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 01.439	1 11.295	14 .038
15	0 02.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 01.603	1 11.459	15 .041
16	0 02.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 01.767	1 11.624	16 .044
17	0 02.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 01.932	1 11.788	17 .047
18	0 02.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 02.096	1 11.952	18 .049
19	0 03.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 02.260	1 12.117	19 .052
20	0 03.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 02.424	1 12.281	20 .055
21	0 03.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 02.589	1 12.445	21 .057
22	0 03.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 02.753	1 12.609	22 .060
23	0 03.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 02.917	1 12.774	23 .063
24	0 03.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 03.081	1 12.938	24 .066
25	0 04.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 03.246	1 13.102	25 .068
26	0 04.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 03.410	1 13.266	26 .071
27	0 04.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 03.574	1 13.431	27 .074
28	0 04.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 03.739	1 13.595	28 .077
29	0 04.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 03.903	1 13.759	29 .079
30	0 04.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 04.067	1 13.924	30 .082
31	0 05.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 04.231	1 14.088	31 .085
32	0 05.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 04.396	1 14.252	32 .088
33	0 05.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 04.560	1 14.416	33 .090
34	0 05.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 04.724	1 14.581	34 .093
35	0 05.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 04.888	1 14.745	35 .096
36	0 05.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 05.053	1 14.909	36 .099
37	0 06.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 05.217	1 15.073	37 .101
38	0 06.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 05.381	1 15.238	38 .104
39	0 06.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 05.546	1 15.402	39 .107
40	0 06.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 05.710	1 15.566	40 .110
41	0 06.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 05.874	1 15.731	41 .112
42	0 06.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 06.038	1 15.895	42 .115
43	0 07.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 06.203	1 16.059	43 .118
44	0 07.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 06.367	1 16.223	44 .120
45	0 07.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 06.531	1 16.388	45 .123
46	0 07.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 06.695	1 16.552	46 .126
47	0 07.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 06.860	1 16.716	47 .129
48	0 07.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 07.024	1 16.881	48 .131
49	0 08.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 07.188	1 17.045	49 .134
50	0 08.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 07.353	1 17.209	50 .137
51	0 08.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 07.517	1 17.373	51 .140
52	0 08.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 07.681	1 17.538	52 .142
53	0 08.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 07.845	1 17.702	53 .145
54	0 08.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 08.010	1 17.866	54 .148
55	0 09.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 08.174	1 18.030	55 .151
56	0 09.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 08.338	1 18.195	56 .153
57	0 09.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 08.502	1 18.359	57 .156
58	0 09.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 08.667	1 18.523	58 .159
59	0 09.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 08.831	1 18.688	59 .162

TABLE III. MEAN SOLAR INTO SIDEREAL TIME.

Mean Solar	8 h.	9 h.	10 h.	11 h.	12 h.	13 h.	14 h.	15 h.	For Seconds.
m.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	s.
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 08.134	2 17.991	2 27.847	1 0.003
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 08.298	2 18.155	2 28.011	2 .005
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 08.463	2 18.319	2 28.176	3 .008
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 08.627	2 18.483	2 28.340	4 .011
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 08.791	2 18.648	2 28.504	5 .014
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 08.956	2 18.812	2 28.668	6 .016
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 09.120	2 18.976	2 28.833	7 .019
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 09.284	2 19.141	2 28.997	8 .022
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 09.448	2 19.305	2 29.161	9 .025
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 09.613	2 19.469	2 29.326	10 .027
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 09.777	2 19.633	2 29.490	11 .030
11	1 20.659	1 30.515	1 40.372	1 50.228	2 00.085	2 09.941	2 19.798	2 29.654	12 .033
12	1 20.823	1 30.680	1 40.536	1 50.393	2 00.249	2 10.105	2 19.962	2 29.818	13 .036
13	1 20.987	1 30.844	1 40.700	1 50.557	2 00.413	2 10.270	2 20.126	2 29.983	14 .038
14	1 21.152	1 31.008	1 40.865	1 50.721	2 00.578	2 10.434	2 20.290	2 30.147	15 .041
15	1 21.316	1 31.172	1 41.029	1 50.885	2 00.742	2 10.598	2 20.455	2 30.311	16 .044
16	1 21.480	1 31.337	1 41.193	1 51.050	2 00.906	2 10.763	2 20.619	2 30.476	17 .047
17	1 21.644	1 31.501	1 41.357	1 51.214	2 01.070	2 10.927	2 20.783	2 30.640	18 .049
18	1 21.809	1 31.665	1 41.522	1 51.378	2 01.235	2 11.091	2 20.948	2 30.804	19 .052
19	1 21.973	1 31.829	1 41.686	1 51.542	2 01.399	2 11.255	2 21.112	2 30.968	20 .055
20	1 22.137	1 31.994	1 41.850	1 51.707	2 01.563	2 11.420	2 21.276	2 31.133	21 .057
21	1 22.302	1 32.158	1 42.015	1 51.871	2 01.727	2 11.584	2 21.440	2 31.297	22 .060
22	1 22.466	1 32.322	1 42.179	1 52.035	2 01.892	2 11.748	2 21.605	2 31.461	23 .063
23	1 22.630	1 32.487	1 42.343	1 52.200	2 02.056	2 11.912	2 21.769	2 31.625	24 .066
24	1 22.794	1 32.651	1 42.507	1 52.364	2 02.220	2 12.077	2 21.933	2 31.790	25 .068
25	1 22.959	1 32.815	1 42.672	1 52.528	2 02.385	2 12.241	2 22.098	2 31.954	26 .071
26	1 23.123	1 32.979	1 42.836	1 52.692	2 02.549	2 12.405	2 22.262	2 32.118	27 .074
27	1 23.287	1 33.144	1 43.000	1 52.857	2 02.713	2 12.570	2 22.426	2 32.283	28 .077
28	1 23.451	1 33.308	1 43.164	1 53.021	2 02.877	2 12.734	2 22.590	2 32.447	29 .079
29	1 23.616	1 33.472	1 43.329	1 53.185	2 03.042	2 12.898	2 22.755	2 32.611	30 .082
30	1 23.780	1 33.637	1 43.493	1 53.349	2 03.206	2 13.062	2 22.919	2 32.775	31 .085
31	1 23.944	1 33.801	1 43.657	1 53.514	2 03.370	2 13.227	2 23.083	2 32.940	32 .088
32	1 24.109	1 33.965	1 43.822	1 53.678	2 03.534	2 13.391	2 23.247	2 33.104	33 .090
33	1 24.273	1 34.129	1 43.986	1 53.842	2 03.699	2 13.555	2 23.412	2 33.268	34 .093
34	1 24.437	1 34.294	1 44.150	1 54.007	2 03.863	2 13.720	2 23.576	2 33.432	35 .096
35	1 24.601	1 34.458	1 44.314	1 54.171	2 04.027	2 13.884	2 23.740	2 33.597	36 .099
36	1 24.766	1 34.622	1 44.479	1 54.335	2 04.192	2 14.048	2 23.905	2 33.761	37 .101
37	1 24.930	1 34.786	1 44.643	1 54.499	2 04.356	2 14.212	2 24.069	2 33.925	38 .104
38	1 25.094	1 34.951	1 44.807	1 54.664	2 04.520	2 14.377	2 24.233	2 34.090	39 .107
39	1 25.259	1 35.115	1 44.971	1 54.828	2 04.684	2 14.541	2 24.397	2 34.254	40 .110
40	1 25.423	1 35.279	1 45.136	1 54.992	2 04.849	2 14.705	2 24.562	2 34.418	41 .112
41	1 25.587	1 35.444	1 45.300	1 55.156	2 05.013	2 14.869	2 24.726	2 34.582	42 .115
42	1 25.751	1 35.608	1 45.464	1 55.321	2 05.177	2 15.034	2 24.890	2 34.747	43 .118
43	1 25.916	1 35.772	1 45.629	1 55.485	2 05.342	2 15.198	2 25.054	2 34.911	44 .120
44	1 26.080	1 35.936	1 45.793	1 55.649	2 05.506	2 15.362	2 25.219	2 35.075	45 .123
45	1 26.244	1 36.101	1 45.957	1 55.814	2 05.670	2 15.527	2 25.383	2 35.239	46 .126
46	1 26.408	1 36.265	1 46.121	1 55.978	2 05.834	2 15.691	2 25.547	2 35.404	47 .129
47	1 26.573	1 36.429	1 46.286	1 56.142	2 05.999	2 15.855	2 25.712	2 35.568	48 .131
48	1 26.737	1 36.593	1 46.450	1 56.306	2 06.163	2 16.019	2 25.876	2 35.732	49 .134
49	1 26.901	1 36.758	1 46.614	1 56.471	2 06.327	2 16.184	2 26.040	2 35.897	50 .137
50	1 27.066	1 36.922	1 46.778	1 56.635	2 06.491	2 16.348	2 26.204	2 36.061	51 .140
51	1 27.230	1 37.086	1 46.943	1 56.799	2 06.656	2 16.512	2 26.369	2 36.225	52 .143
52	1 27.394	1 37.251	1 47.107	1 56.964	2 06.820	2 16.676	2 26.533	2 36.389	53 .145
53	1 27.558	1 37.415	1 47.271	1 57.128	2 06.984	2 16.841	2 26.697	2 36.554	54 .148
54	1 27.723	1 37.579	1 47.436	1 57.292	2 07.149	2 17.005	2 26.861	2 36.718	55 .151
55	1 27.887	1 37.743	1 47.600	1 57.456	2 07.313	2 17.169	2 27.026	2 36.882	56 .153
56	1 28.051	1 37.908	1 47.764	1 57.621	2 07.477	2 17.334	2 27.190	2 37.047	57 .156
57	1 28.215	1 38.072	1 47.928	1 57.785	2 07.641	2 17.498	2 27.354	2 37.211	58 .159
58	1 28.380	1 38.236	1 48.093	1 57.949	2 07.806	2 17.662	2 27.519	2 37.375	59 .162
59	1 28.544	1 38.400	1 48.257	1 58.113	2 07.970	2 17.826	2 27.683	2 37.539	

TABLE III. MEAN SOLAR INTO SIDEREAL TIME.

Mean Solar	16 h.	17 h.	18 h.	19 h.	20 h.	21 h.	22 h.	23 h.	For Seconds.
m	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	s. s.
0	2 37.704	2 47.560	2 57.417	3 07.273	3 17.129	3 26.986	3 36.842	3 46.699	1 0.003
1	2 37.868	2 47.724	2 57.581	3 07.437	3 17.294	3 27.150	3 37.007	3 46.863	2 .006
2	2 38.032	2 47.889	2 57.745	3 07.602	3 17.458	3 27.315	3 37.171	3 47.027	3 .008
3	2 38.196	2 48.053	2 57.909	3 07.766	3 17.622	3 27.479	3 37.335	3 47.192	4 .011
4	2 38.361	2 48.217	2 58.074	3 07.930	3 17.787	3 27.643	3 37.500	3 47.356	5 .014
5	2 38.525	2 48.381	2 58.238	3 08.094	3 17.951	3 27.807	3 37.664	3 47.520	6 .016
6	2 38.689	2 48.546	2 58.402	3 08.259	3 18.115	3 27.972	3 37.828	3 47.685	7 .019
7	2 38.854	2 48.710	2 58.566	3 08.423	3 18.279	3 28.136	3 37.992	3 47.849	8 .022
8	2 39.018	2 48.874	2 58.731	3 08.587	3 18.444	3 28.300	3 38.157	3 48.013	9 .025
9	2 39.182	2 49.039	2 58.895	3 08.751	3 18.608	3 28.464	3 38.321	3 48.177	10 .027
10	2 39.346	2 49.203	2 59.059	3 08.916	3 18.772	3 28.629	3 38.485	3 48.342	11 .030
11	2 39.511	2 49.367	2 59.224	3 09.080	3 18.937	3 28.793	3 38.649	3 48.506	12 .033
12	2 39.675	2 49.531	2 59.388	3 09.244	3 19.101	3 28.957	3 38.814	3 48.670	13 .036
13	2 39.839	2 49.696	2 59.552	3 09.409	3 19.265	3 29.122	3 38.978	3 48.834	14 .038
14	2 40.003	2 49.860	2 59.716	3 09.573	3 19.429	3 29.286	3 39.142	3 48.999	15 .041
15	2 40.168	2 50.024	2 59.881	3 09.737	3 19.594	3 29.450	3 39.307	3 49.163	16 .044
16	2 40.332	2 50.188	3 00.045	3 09.901	3 19.758	3 29.614	3 39.471	3 49.327	17 .047
17	2 40.496	2 50.353	3 00.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	18 .049
18	2 40.661	2 50.517	3 00.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	19 .052
19	2 40.825	2 50.681	3 00.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	20 .055
20	2 40.989	2 50.846	3 00.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	21 .057
21	2 41.153	2 51.010	3 00.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	22 .060
22	2 41.318	2 51.174	3 01.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	23 .063
23	2 41.482	2 51.338	3 01.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	24 .066
24	2 41.646	2 51.503	3 01.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	25 .068
25	2 41.810	2 51.667	3 01.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	26 .071
26	2 41.975	2 51.831	3 01.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	27 .074
27	2 42.139	2 51.995	3 01.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	28 .077
28	2 42.303	2 52.160	3 02.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	29 .079
29	2 42.468	2 52.324	3 02.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	30 .082
30	2 42.632	2 52.488	3 02.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	31 .085
31	2 42.796	2 52.653	3 02.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	32 .088
32	2 42.960	2 52.817	3 02.673	3 12.530	3 22.386	3 32.243	3 42 .799	3 51.956	33 .090
33	2 43.125	2 52.981	3 02.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	34 .093
34	2 43.289	2 53.145	3 03.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	35 .096
35	2 43.453	2 53.310	3 03.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	36 .099
36	2 43.617	2 53.474	3 03.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	37 .101
37	2 43.782	2 53.638	3 03.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	38 .104
38	2 43.946	2 53.803	3 03.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	39 .107
39	2 44.110	2 53.967	3 03.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	40 .110
40	2 44.275	2 54.131	3 03.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	41 .112
41	2 44.439	2 54.295	3 04.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	42 .115
42	2 44.603	2 54.460	3 04.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	43 .118
43	2 44.767	2 54.624	3 04.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	44 .120
44	2 44.932	2 54.788	3 04.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	45 .123
45	2 45.096	2 54.952	3 04.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	46 .126
46	2 45.260	2 55.117	3 04.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	47 .129
47	2 45.425	2 55.281	3 05.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	48 .131
48	2 45.589	2 55.445	3 05.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	49 .134
49	2 45.753	2 55.610	3 05.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	50 .137
50	2 45.917	2 55.774	3 05.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	51 .140
51	2 46.082	2 55.938	3 05.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	52 .142
52	2 46.246	2 56.102	3 05.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	53 .145
53	2 46.410	2 56.267	3 06.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	54 .148
54	2 46.574	2 56.431	3 06.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	55 .151
55	2 46.739	2 56.595	3 06.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	56 .153
56	2 46.903	2 56.759	3 06.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	57 .156
57	2 47.067	2 56.924	3 06.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	58 .159
58	2 47.232	2 57.088	3 06.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	59 .162
59	2 47.396	2 57.252	3 07.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	

TABLE IV.

TABLE GIVING THE CORRECTION OF α URSÆ MINORIS AND δ URSÆ MINORIS
FOR TERMS OF NUTATION INVOLVING 2ϵ .

1800° — 1800°	α Ursæ Minoris.		δ Ursæ Minoris.		1800° — 1800°	1800° — 1800°	α Ursæ Minoris.		δ Ursæ Minoris.		1800° — 1800°
	R.A.	Dec.	R.A.	Dec.			R.A.	Dec.	R.A.	Dec.	
0	—229	+03	—008	—09	90	45	—075	—08	+078	—01	135
1	231	.02	.005	.09	91	46	.067	.08	.078	—01	136
2	233	.02	—003	.09	92	47	.058	.08	.079	.00	137
3	235	.02	.000	.09	93	48	.050	.08	.079	.00	138
4	236	.01	+003	.09	94	49	.042	.08	.078	.00	139
5	—238	+01	+006	—09	95	50	—034	—08	+078	+01	140
6	239	+01	.008	.09	96	51	.026	.08	.078	.01	141
7	240	.00	.011	.09	97	52	.017	.08	.077	.01	142
8	240	.00	.013	.09	98	53	—008	.08	.077	.02	143
9	240	.00	.016	.09	99	54	.000	.08	.077	.02	144
10	—240	.00	+019	—09	100	55	+008	—08	+076	+02	145
11	240	—01	.021	.09	101	56	.016	.08	.075	.03	146
12	239	.01	.024	.08	102	57	.025	.08	.074	.03	147
13	238	.01	.026	.08	103	58	.033	.08	.073	.03	148
14	236	.02	.029	.08	104	59	.042	.08	.072	.04	149
15	—235	—02	+032	—08	105	60	+050	—08	+071	+04	150
16	233	.02	.034	.08	106	61	.058	.08	.070	.04	151
17	231	.03	.037	.08	107	62	.066	.08	.069	.04	152
18	229	.03	.039	.08	108	63	.074	.08	.067	.05	153
19	226	.03	.042	.08	109	64	.082	.08	.066	.05	154
20	—223	—03	+044	—07	110	65	+090	—07	+064	+05	155
21	220	.03	.046	.07	111	66	.097	.07	.062	.05	156
22	216	.04	.048	.07	112	67	.105	.07	.061	.06	157
23	212	.04	.050	.07	113	68	.112	.07	.060	.06	158
24	208	.04	.052	.07	114	69	.120	.07	.058	.06	159
25	—204	—04	+054	—06	115	70	+127	—07	+056	+06	160
26	200	.05	.055	.06	116	71	.134	.07	.054	.06	161
27	196	.05	.057	.06	117	72	.141	.07	.052	.07	162
28	190	.05	.059	.06	118	73	.148	.07	.050	.07	163
29	185	.05	.061	.06	119	74	.154	.06	.048	.07	164
30	—179	—05	+063	—05	120	75	+161	—06	+046	+07	165
31	173	.06	.064	.05	121	76	.167	.06	.045	.07	166
32	168	.06	.065	.05	122	77	.173	.06	.043	.08	167
33	162	.06	.067	.05	123	78	.178	.05	.040	.08	168
34	155	.06	.068	.04	124	79	.184	.05	.037	.08	169
35	—148	—06	+070	—04	125	80	+189	—05	+034	+08	170
36	141	.07	.071	.04	126	81	.194	.05	.031	.08	171
37	133	.07	.072	.03	127	82	.199	.04	.029	.08	172
38	126	.07	.073	.03	128	83	.204	.04	.026	.08	173
39	119	.07	.074	.03	129	84	.207	.04	.024	.09	174
40	—113	—07	+075	—02	130	85	+212	—04	+022	+09	175
41	106	.07	.076	.02	131	86	.216	.03	.020	.09	176
42	.099	.07	.077	.02	132	87	.220	.03	.017	.09	177
43	.092	.08	.077	.02	133	88	.223	.03	.013	.09	178
44	.084	.08	.078	.01	134	89	.226	.03	.011	.09	179
45	—075	—08	+078	—01	135	90	+229	—03	+008	+09	180

NOTE. — These corrections were omitted in the places of these Stars in the volumes of this Ephemeris for 1857, 1858, and 1859. They have been applied in this volume.

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